955 PAGES 1 TO 48

THE LANCET

Offices: 7, ADAM STREET, ADELPHI, W.C.2

Telegrams: LANCET, RAND, LONDON Telephone: TEMPLE BAR 7228 and 7229

VOL. I OF VOL. II, 1955
No. 6879 VOL. CCLXIX

LONDON, SATURDAY, JULY 2, 1955
Founded 1823 PUBLISHED WEEKLY Registered as a Newspaper

Pp. 104—Price 1s. 6d.
Annual Subscription: £3 3s.

'ANCOLAN'
TRADE MARK
Tablets containing 25 mg meclozine dihydrochloride
THE B.D.H. ANTIHISTAMINIC

IN HAY FEVER *and other allergic conditions and* MOTION SICKNESS
ADVANTAGES long duration of action
exceptionally well tolerated
Basic N.H.S. prices: Bottles of 25 tablets 3/8
" "250 " 32/6
Literature and samples will be sent on request
THE BRITISH DRUG HOUSES LTD. (Medical Dept.) LONDON N.I

OXFORD MEDICAL PUBLICATIONS
SEE PAGE 2

GENITAL PROLAPSE
AND ALLIED CONDITIONS
By PERCY MALPAS, Ch.M., F.R.C.S.E., F.R.C.O.G.
Surgeon to the Women's Hospital, Liverpool; Lecturer in Clinical Gynæcology, the University of Liverpool.

An important contribution to the already extensive literature on the subject. Although much of what has been written in the past is still valid, the treatment of genital prolapse is essentially a practical discipline and is based primarily on direct experience. In this volume the author attempts to clarify and systematize a personal experience gained from some seven thousand operations on cases of prolapse.

200 pages Illustrated 47s. 6d. Ready July
Harvey & Blythe Ltd., 212, Shaftesbury Avenue, W.C.2

Second Edition
SURGERY: A TEXTBOOK FOR STUDENTS
By CHARLES AUBREY PANNETT, B.Sc., M.D., F.R.C.S.
Professor of Surgery, University of London; Director of the Surgical Unit, St. Mary's Hospital, London; sometime member of the Court of Examiners, R.C.S. Eng., and Examiner to the Universities of London, Manchester, and Cardiff.
769 + xiv Price 27s. 6d. net, plus 1s. postage
Extensively illustrated throughout text
Hodder & Stoughton Ltd., 20, Warwick-square, London, E.C.4

Third Edition
ABDOMINAL OPERATIONS
By RODNEY MAINGOT, F.R.C.S.
Surgeon, Royal Free Hospital
Completely revised. 74 Chapters (11 new). 1594 Illustrations 11 Colour Plates. 1568 Pages. Price £8 10s. net.
H. K. Lewis & Co. Ltd., 136, Gower-street, W.C.1

Now in its Second Edition
VARICOSE VEINS
By R. ROWDEN FOOTE
Price 55s. net
"Unqualified praise can be accorded to this beautifully illustrated monogram."—*Edinburgh Medical Journal.*
Butterworths, 88, Kingsway, London, W.C.2

Second Edition
THE CARE OF TUBERCULOSIS IN THE HOME
By JAMES MAXWELL, M.D., F.R.C.P.
Physician, Royal Chest Hospital; Physician to the Ministry's Mass X-ray Unit; Consulting Physician, Royal National Sanatorium, Bournemouth; late Physician, St. Bartholomew's Hospital
Demy 8vo 114 + xii Illustrations 7s. 6d. net, plus 4d. postage
Hodder & Stoughton Ltd., 20, Warwick-square, London, E.C.4

MANAGEMENT OF BURNS
Six articles prepared by a subcommittee of the BRITISH ASSOCIATION OF PLASTIC SURGEONS
Reprinted from THE LANCET *with an appendix*
These articles record the practice of surgeons who are treating burns every day and who see the good results of treatment that is carefully planned from the start. Here is their plan, fully but briefly set out.
48 pages Price 2s. 6d. (postage 4d.)
The Lancet Limited, 7, Adam-street, Adelphi, London, W.C.2

LATEST VOLUMES

New (Sixth) Edition *Ready this month*
RECENT ADVANCES IN NEUROLOGY AND NEUROPSYCHIATRY
By Sir RUSSELL BRAIN, M.A., D.M., F.R.C.P., and E. B. STRAUSS, M.A., D.M., F.R.C.P.
48 Illustrations. 30s.

HIGH BLOOD PRESSURE
By G. W. PICKERING, M.A., M.D., F.R.C.P.
100 Illustrations 65s.

RECENT ADVANCES IN RADIOLOGY
New (Third) Edition. By THOMAS LODGE, M.B., F.F.R., D.M.R.
182 Illustrations. 45s

ALLEN & HANBURYS LTD, EVANS MEDICAL SUPPLIES, PHARMACEUTICAL

RENSIC MEDICINE *Ready this month*
for Students and Practitioners
F.R.C.P., LL.D., F.R.S.(Ed.), and F. S. FIDDES, *O.B.E.*, M.D.
40s.

THE DISTILLERS COM

GLOUCESTER PLACE, LONDON, W.1

R31
.A3

master stroke

More and more, practitioners and specialists are turning to ACHROMYCIN tetracycline—now recognised as a master stroke in the advancement of antibiotic therapy. In every sense, this newest Lederle antibiotic measures up to present-day requirements. In its antibacterial range, it is unsurpassed by any other broad-spectrum antibiotic. It is stable and readily soluble—quickly producing effective blood levels and diffusing rapidly into the body tissues. It is highly successful when taken by mouth, yet can be given safely by the intramuscular or intravenous routes when there is need for urgent control of infection. And to these merits can be added its relatively low frequency and mild degree of side effects.

ACHROMYCIN*

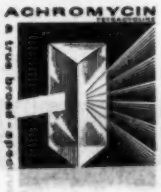
TETRACYCLINE

Today's broad-spectrum antibiotic

Available in the following forms:
CAPSULES · INTRAMUSCULAR · INTRAVENOUS · OINTMENT · OPHTHALMIC OINTMENT · ORAL SUSPENSION PEDIATRIC DROPS · SOLUBLE TABLETS · SPERSOIDS† Dispersible Powder · TABLETS

AT 1 GRAM DAILY DOSAGE SHOWS TRUE ECONOMY

ACHROMYCIN



Lederle LABORATORIES DIVISION
Cyanamid Products Ltd. BOUND BROOK

JULY 2, 1955 PAGES 1 TO 48

THE LANCET

A JOURNAL OF BRITISH AND FOREIGN MEDICINE, SURGERY, OBSTETRICS, PHYSIOLOGY, PATHOLOGY, PHARMACOLOGY, PUBLIC HEALTH, AND NEWS

No. 6879 LONDON: SATURDAY, JULY 2, 1955 CCLXIX

CONTENTS

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT

ORIGINAL ARTICLES

The Micro-environment of Inflammation: or Metchnikoff Revisited
Prof. R. J. DUBOS, SC.D..... 1

Poliomyelitis and Tonsillectomy: A Report of the Medical Research Council Committee on Inoculation Procedures and Neurological Lesions.. 5

Congenital Dermal Sinuses in Children
J. C. HAWORTH, M.R.C.P.
R. B. ZACHARY, F.R.C.S. 10

The Antibiotic Residues in Amœbiasis
T. G. ARMSTRONG, M.R.C.P.
A. J. WILMOT, M.R.C.P.
R. ELSDON-DEW, M.D..... 14

A Short Laboratory Screening Test for Phæochromocytoma
R. MOULTON, B.A.
D. A. WILLOUGHBY..... 16

Mitral Incompetence in Experimental Auricular Fibrillation
RAYMOND DALEY, M.R.C.P.
I. K. R. MCMILLAN, M.B.
RICHARD GORLIN, M.D..... 18

Ethyl Biscoumacetate as an Inhibitor of Sickling
F. E. D. GRIFFITHS, M.B..... 20

PRELIMINARY COMMUNICATION

Elective Cardiac Arrest
D. G. MELROSE, B.M.
B. DREYER, F.R.C.S.
H. H. BENTALL, F.R.C.S.
J. B. E. BAKER, B.M..... 21

NEW INVENTIONS

A Simple Projection Apparatus
A. D. MORGAN, M.B.
H. A. SISSONS, M.B. 23

SPECIAL ARTICLES

If I were a Minister of Health in Asia
S. M. KEENY..... 30

Boards of Governors of Teaching Hospitals and Regional Hospital Boards 31

REVIEWS

Notices of Books..... 24

LEADING ARTICLES

THE PHYSICIAN AND INDUSTRIAL HEALTH 25
SYNTHETIC ANALGESICS 26
ARTIFICIAL PNEUMOTHORAX 26

ANNOTATIONS

The I. R. U..... 27
Trace Elements 27
Control of Poliomyelitis Vaccine.. 28
Mental Disorders due to Corticotrophin and Cortisone..... 29
The Blood-brain Barrier 29

MEDICAL CONFERENCES

Tuberculosis 32
Rheumatology 34

MEDICINE AND THE LAW

Care of a Patient on a Trolley.... 36
Recognition of Industrial Hazards 36
Electroconvulsant Treatment 37
Explosion during Electrical Cauterisation 37

LETTERS TO THE EDITOR

Tuberculosis in Korea (Dr. H. A. Codington) 39
Treatment of Chronic Amœbic Dysentery (Lieut.-Colonel Inder Singh, F.R.F.P.S.; Dr. C. B. Andrade) 40
Heroin (Dr. J. S. Happel)..... 40
Electrophoresis of Plasma-proteins (Dr. C.-B. Laurell, Dr. S. Laurell) 40
Low-lactose Milk for Congenital Galactosæmia (Dr. W. J. Matheson) 41
Diamox in Glaucoma (Dr. Herman Zondek) 41
Teaching Deaf Children (Mrs. Ingall) 41
Respiratory Obstruction in Acute Leukæmia (Dr. J. R. H. Towers, Dr. J. R. Fountain) 42
Treatment of Constipation (Mr. D. Lang Stevenson, F.R.C.S.)..... 42
By Any Other Name (Dr. R. I. McCallum, Mr. D. J. Newell, B.A.) 43
Idiopathic Granular Proctitis (Dr. A. G. Shora) 43
The Treatment of Eclampsia (Dr. D. B. Scott) 43
Diaphragmatic Rupture (Dr. Imran Hatiboğlu)..... 44
Sterilisation of Blankets (Dr. Robert Blowers, Dr. K. R. Wallace)... 44
Mental Retardation (Mrs. Bennett; Dr. D. Jackson)..... 44
Metabolism of Cancer Cells (Mr. J. W. Graham, F.R.C.S.)..... 45
Cowpox in Man (Dr. Bernard Laurance) 45
Quarantine Measures in Poliomyelitis (Dr. A. P. Goffe, Miss Edith Parfitt, B.SC.)..... 45
Precipitation of Sodium Urate in Vitro (Dr. Michel Brous)..... 46

PARLIAMENT

Medical and Health Services in the Colonies 37
Question Time 38

IN ENGLAND NOW

A Running Commentary by Peripatetic Correspondents 38

PUBLIC HEALTH

Toxic Chemicals in Agriculture... 46
Epidemic Vomiting in Exeter.... 46
Smoking in the United States.... 46

OBITUARY

Stuart Ian Alexander Laidlaw... 47

NOTES AND NEWS

A New Journal on Alcoholism.... 47
A Scottish Medical Journal..... 47
Social Psychiatry 47
Medical Films..... 47

University of Cambridge..... 48
University of London..... 48
University of Bristol..... 48
Royal College of Surgeons of England 48
Society of Apothecaries of London 48
Nutrition Society 48
Institute of Diseases of the Chest, London 48

Appointments 46
Births, Marriages, and Deaths... 47

for prolonged therapy . . .

'MIXTAMYCIN'

brand

streptomycin plus dihydrostreptomycin

. . . with reduced ototoxicity

Distributed by:
ALLEN & HANBURYS LTD. BRITISH DRUG HOUSES LTD. BURROUGHS WELLCOME & CO.
EVANS MEDICAL SUPPLIES LTD. IMPERIAL CHEMICAL (PHARMACEUTICALS) LTD.
PHARMACEUTICAL SPECIALITIES (MAY & BAKER) LTD.

Manufactured by:
THE DISTILLERS COMPANY (BIOCHEMICALS) LIMITED

Owners of the trademark 'Mixtamycin'

OXFORD MEDICAL

PUBLICATIONS

RECENTLY PUBLISHED

MAN'S MASTERY OF MALARIA

by PAUL F. RUSSELL, *M.D., M.P.H.*

Division of Medicine and Public Health, Rockefeller Foundation, New York

324 *pages* 25 *illustrations* **25s.** *net*

MEDICAL STUDENTS AND MEDICAL SCIENCES

Some Problems of Education in Britain and the United States

by D. C. SINCLAIR, *M.A., M.D.*

University Demonstrator in Human Anatomy in the University of Oxford; Lecturer in Anatomy, Pembroke College, Oxford

168 *pages* **25s.** *net*

THE SUBNORMAL MIND

by Sir CYRIL BURT, *D.Sc., Hon.Litt.D., Hon.LL.D.*

Fellow of the British Academy; Emeritus Professor of Psychology in the University of London; Honorary Fellow of Jesus College, Oxford

THIRD EDITION 412 *pages* **20s.** *net*

OXFORD UNIVERSITY PRESS

HENRY KIMPTON'S PUBLICATIONS

New Book — Ready this Month

BONE AND JOINT X-RAY DIAGNOSIS

By **MAX RITVO**, M.D.

7″ × 10″ 752 Pages 568 Illustrations on 398 Engravings Cloth Price **£7 5s.** net

New (2nd) Edition — Ready this Month

HEART DISEASE

ITS DIAGNOSIS AND TREATMENT

By **EMANUEL GOLDBERGER**, B.S., M.D.

SECOND EDITION, REVISED AND ENLARGED

6″ × 9½″ 781 Pages 298 Illustrations on 107 Figures Cloth Price **92s. 6d.** net

New (4th) Edition — Now Ready

DISEASES AFFECTING THE VULVA

By **ELIZABETH HUNT**, B.A., M.D., Ch.B.(Liverpool)

FOURTH EDITION, REVISED AND ENLARGED

6″ × 10″ 236 Pages 47 Illustrations and 17 Coloured Plates Cloth Price **31s. 6d.** net (Postage 9d.)

New (3rd) Edition — Now Ready

PRACTICE OF ALLERGY

By **WARREN T. VAUGHAN**, M.D.

THIRD EDITION REVISED BY J. HARVEY BLACK, M.D.

7″ × 10″ 1164 Pages 335 Illustrations Cloth Price **£7 17s. 6d.** net

New (2nd) Edition — Just Ready

THE ABNORMAL PNEUMOENCEPHALOGRAM

By **LEO M. DAVIDOFF**, M.D., and **BERNARD S. EPSTEIN**, M.D.

SECOND EDITION, REVISED AND ENLARGED

7″ × 10″ 518 Pages 696 Illustrations on 291 Figures Cloth Price **£5 10s.** net

New (5th) Edition — Just Ready

MANAGEMENT OF OBSTETRIC DIFFICULTIES

By **PAUL TITUS**, M.D.

FIFTH EDITION, REVISED by J. ROBERT WILLSON, M.D., M.S.

6½″ × 9½″ 737 Pages 348 Illustrations and 1 Coloured Plate Cloth Price **92s. 6d.** net

25 Bloomsbury Way **HENRY KIMPTON** **London, W.C.1**

Medical Book Department of Hirschfeld Brothers Ltd.

NAPT Publication

A NEW EDITION

A Psychiatrist looks at Tuberculosis

by Eric Wittkower, M.D.

Associate Professor of Psychiatry, McGill University, Canada; formerly Research Fellow with the National Association for the Prevention of Tuberculosis

First published in 1949, Dr. Wittkower's study met a need for a practical guide to the psychological management of tuberculous patients. The second edition, fully revised, includes a new chapter incorporating work carried out in Canada.

164 pages, clothbound ***12s. 6d.***

Order now from

NATIONAL ASSOCIATION FOR THE PREVENTION OF TUBERCULOSIS

Tavistock House North, Tavistock Square, London, W.C.1.

RYOTOL

for

Chronic Discharge of the Ear

because

RYOTOL is lethal to Ps. Pyocyanea, Staphylococcus aureus, Proteus vulgaris and Streptococcus pyogenes found in C.S.O.M. and Otitis Externa.

The presence of Ps. Pyocyanea has been demonstrated in 90% of cases of chronically discharging ears. This gram-negative, highly resistant organism is unaffected by penicillin, sulphonamides and many other bactericides. It produces abundant pus and is therefore extremely troublesome.

RYOTOL Ear Drops are the outcome of official clinical work on humans, following outstanding results obtained in the veterinary field.

Formula:

Monophenyl ether of ethylene glycol	2.0% v/v
Phenylmercuric Nitrate	0.1% w/v
Phenyl-dimethyl iso-pyrazolone	5% w/v
in a stabilised non-irritant base	

Samples and literature gladly forwarded on request.

RYBAR LABORATORIES LTD.

TANKERTON · KENT

P.R.44

The development of Dibenzylethylenediamine Dipenicillin* is one of the important milestones in antibiotic therapy[1]

** This compound was first prepared and made available to the medical profession by WYETH.*

Its unique physical properties contributed to the world-wide use of PENIDURAL Oral. This reliable oral penicillin led to the production of PENIDURAL Long-Acting, an outstanding repository penicillin, and from this has now been developed the latest addition, PENIDURAL ALL-PURPOSE, which is the complete injectable penicillin. (A *single* injection suffices for the *complete* treatment of the everyday infections caused by penicillin-sensitive organisms. Only in very severe cases need the dose be repeated.)

1. Antibiotics and Chemotherapy, April 1953, p. 351.

ACTIVE CONSTITUENTS

Benzathine Penicillin ..	600,000 units
Procaine Penicillin G ..	300,000 units
Potassium Penicillin G ..	300,000 units

Penidural All-Purpose is available in single-dose, rubber-capped vials containing 1,200,000 units.

Penidural

ALL - PURPOSE

Wyeth

'Penidural' is a registered trade mark.

John Wyeth & Brother Limited, Clifton House, Euston Road, London, N.W.1.

3

magnesium trisilicate

Pattinson's
REGD. BRAND

One of the fine Magnesium Chemicals made for the Pharmaceutical Industry by

PATTINSON'S LIGHT MAGNESIUM TRISILICATE is a fine, odourless, almost tasteless white powder conforming in every respect to the specification of the British Pharmacopoeia 1953.

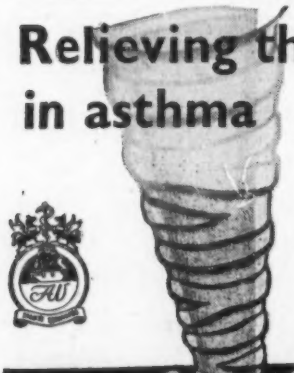
Its value in the treatment of peptic ulcer and related disorders results from its ability to preserve the pH within a most desirable range over an extended period; at the same time, by a threefold action of coating ulcerated areas with gelatinous silica, adsorbing pepsin, and inhibiting excessive peptic activity, it protects damaged and ulcerated areas from proteolysis.

Noted for its palatability and freedom from adverse after-effects, it is non-eructating and does not induce alkalosis or acid rebound. Any tendency to constipation is reduced by its gentle laxative action.

THE WASHINGTON CHEMICAL CO. LTD.

WASHINGTON, CO. DURHAM. *A member of the* TURNER & NEWALL ORGANISATION

Relieving the bronchial tree in asthma



'ASMAC' TABLETS are formularized to provide symptomatic relief of the bronchial tree both during actual dyspnoeic attacks of bronchial asthma, and during remissions.

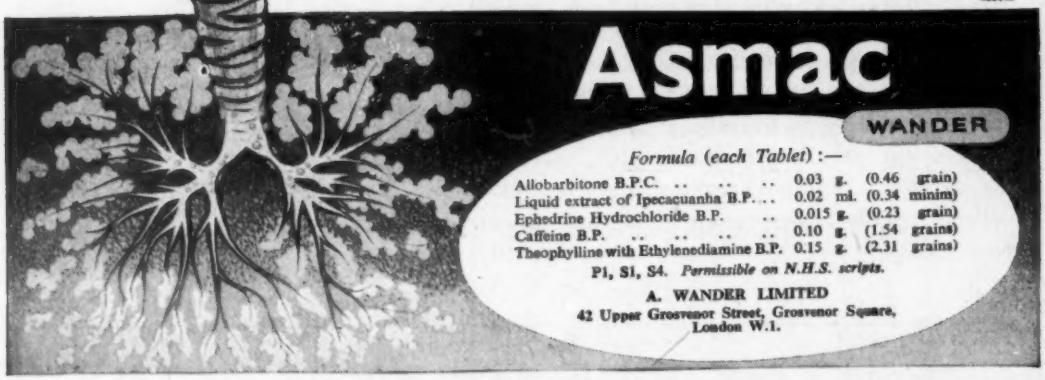
'Asmac' Tablets combine in a single prescription 'official' drugs recognized for their reliability to effect mental sedation, decongestion, expectoration and broncho-dilatation.

Packs and Cost to Pharmacists:

Standard Tube of 20: 3/-

Dispensing Bottles:
100, 12/-; 500, 52/6; 1000, 102/6

MFD.



Asmac

WANDER

Formula (each Tablet):—

Allobarbitone B.P.C.	0.03 g.	(0.46 grain)
Liquid extract of Ipecacuanha B.P.	0.02 ml.	(0.34 minim)
Ephedrine Hydrochloride B.P.	0.015 g.	(0.23 grain)
Caffeine B.P.	0.10 g.	(1.54 grains)
Theophylline with Ethylenediamine B.P.	0.15 g.	(2.31 grains)

P1, S1, S4. *Permissible on N.H.S. scripts.*

A. WANDER LIMITED
42 Upper Grosvenor Street, Grosvenor Square, London W.1.

5 548995 125 50

THE HOUSE OF HEWLETT

S.B.T.

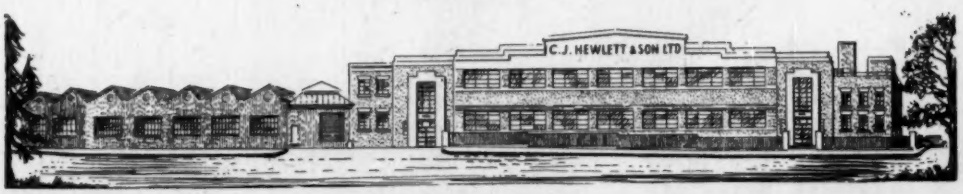
(Sodium Bismuthyltartrate for Injection)

— is a *SAFE* form of therapy

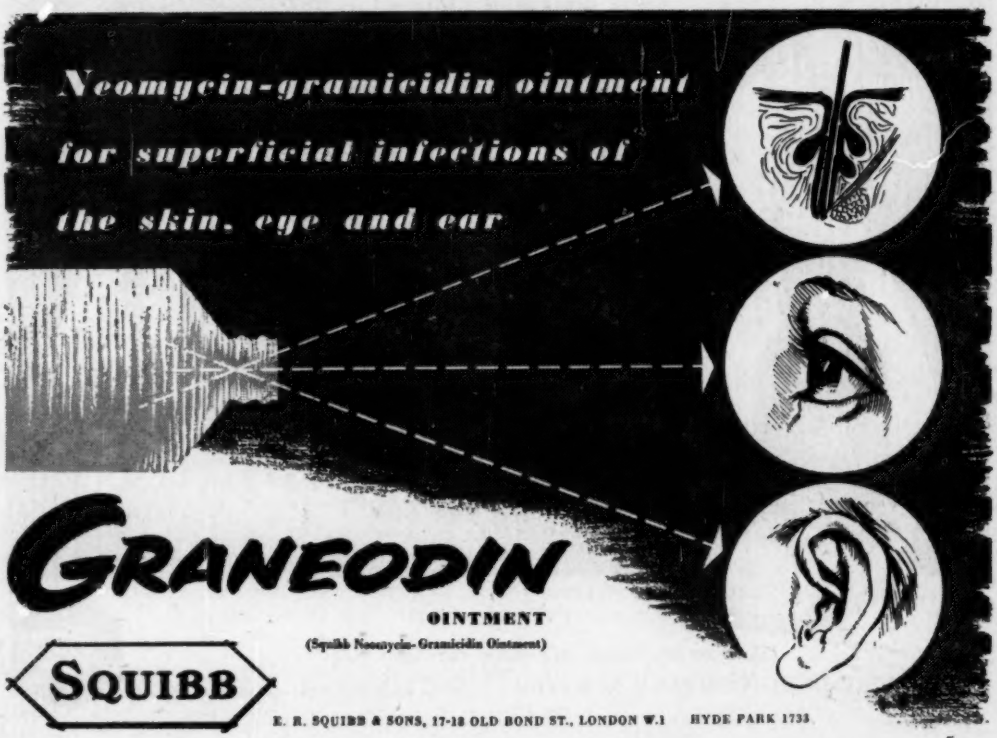
Indicated in the treatment of all forms of rheumatoid arthritis and Still's disease and in some cases of infective arthritis and fibrositis.

Literature available on request

C. J. HEWLETT & SON LTD.
Manufacturing Chemists
KING GEORGE'S AVENUE, WATFORD, HERTS.
Telephone: WATFORD 7761



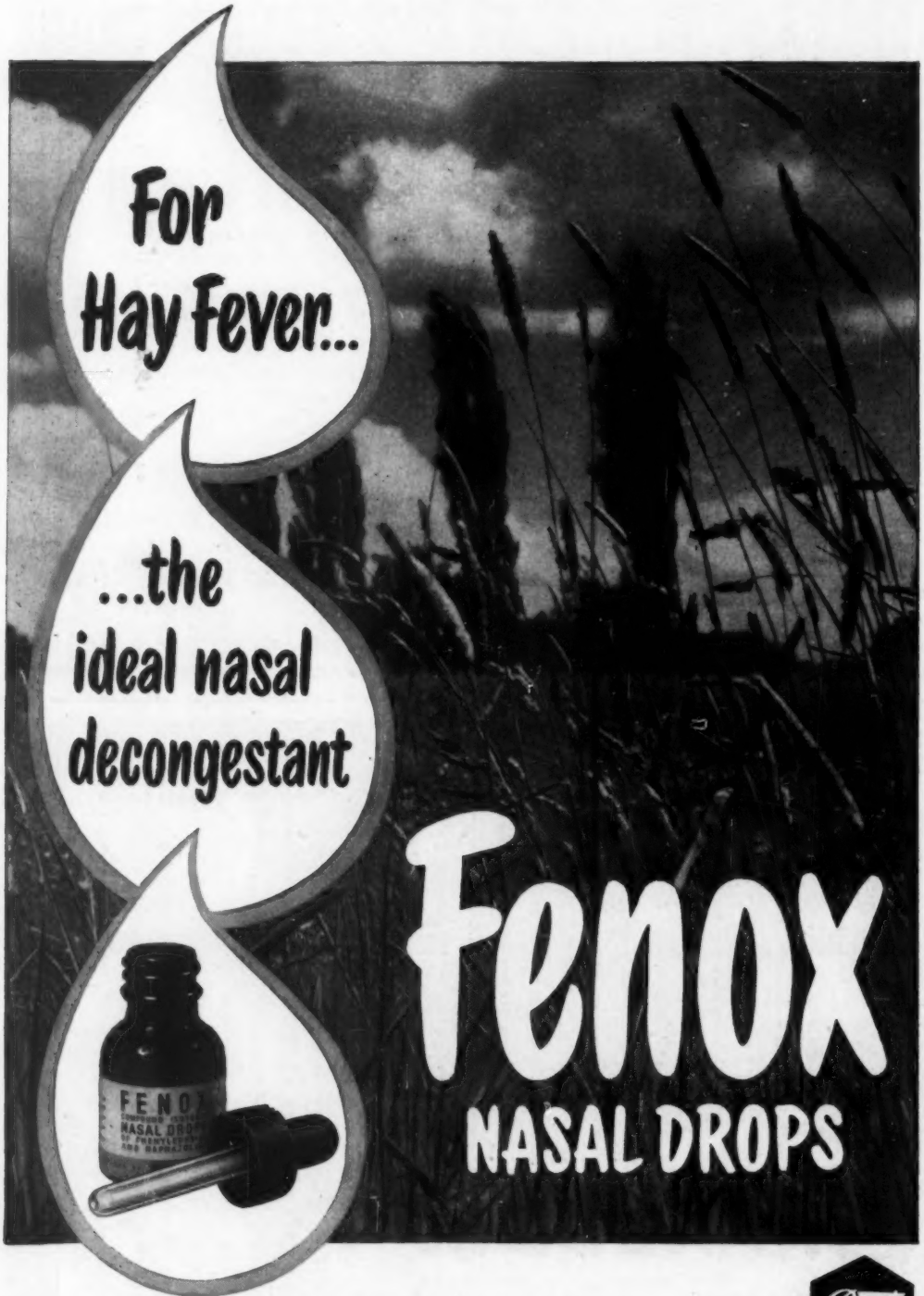
Neomycin-gramicidin ointment for superficial infections of the skin, eye and ear



GRANEODIN
OINTMENT
(Squibb Neomycin-Gramicidin Ointment)

SQUIBB

E. R. SQUIBB & SONS, 17-18 OLD BOND ST., LONDON W.1 HYDE PARK 1733

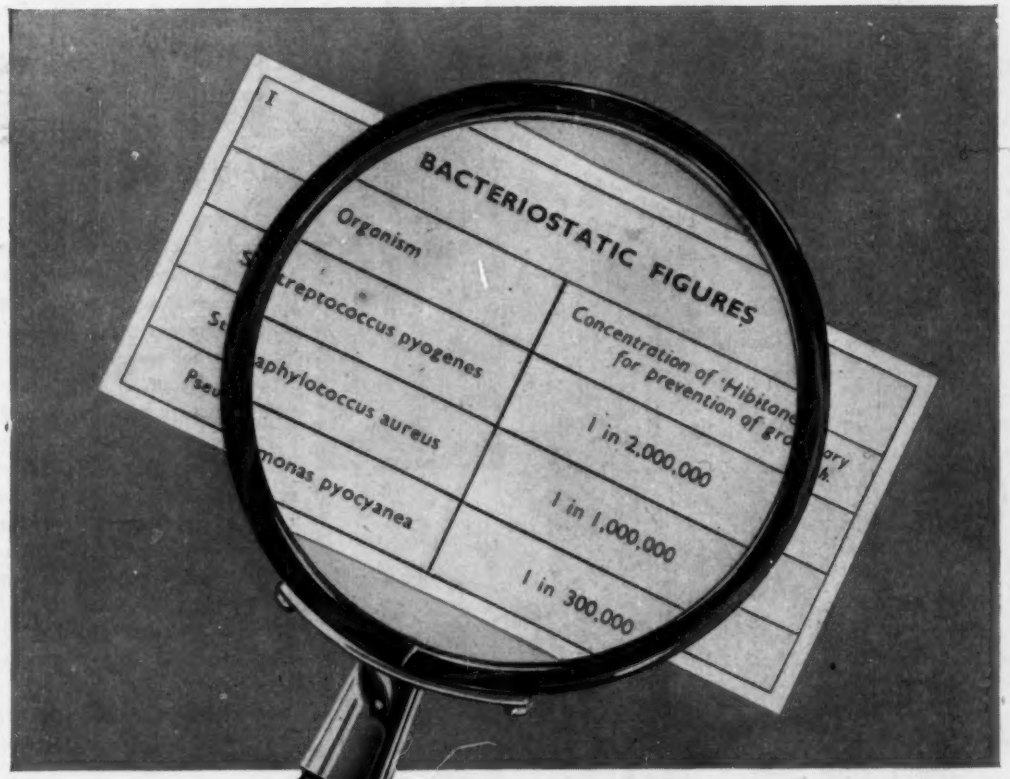


Literature and further information obtainable from
BOOTS PURE DRUG COMPANY LIMITED · NOTTINGHAM · ENGLAND

Boots

S 294

An entirely NEW anti-bacterial agent for local application



'Hibitane'

Trade Mark (Chlorhexidine)

REFERENCES :
Brit. Med. J. (1955), i.81. ibid. (1955), i. 985. Brit. J. Pharmacol. Chemother. (1954), *9*, 192.

'Hibitane' Concentrate 2% Specially prepared to be diluted for ordinary antiseptic purposes. Mildly detergent and anti-rusting.

'Hibitane' Powder For the preparation of pure aqueous and alcoholic solutions, incorporation in creams, ointments, etc.

'Hibitane' Antiseptic Cream 1% For lasting disinfection of the hands and prevention of cross infection. Also as a beneficial skin application.

'Hibitane' Obstetric Cream 1% A non-irritant antiseptic lubricant for vaginal examinations. Combines rapid and complete antibacterial action with persistent effect.

ICI

IMPERIAL CHEMICAL (PHARMACEUTICALS) LIMITED · WILMSLOW · MANCHESTER
A subsidiary company of Imperial Chemical Industries Ltd. Ph. 599

Transvasin

brings the esters of NICOTINIC ACID SALICYLIC ACID p-AMINOBENZOIC ACID to the focal point of soft-tissue rheumatism

The esters in Transvasin, a new preparation developed by Hamol S.A., our Swiss associates, readily pass the skin barrier in therapeutic quantities and enable an effective concentration of the drugs to be built up where they are needed. Transvasin not only induces vasodilation of the skin with a superficial erythema, but also brings about a deep hyperaemia of the underlying tissues. It is non-irritant, and can be safely used on delicate skins.

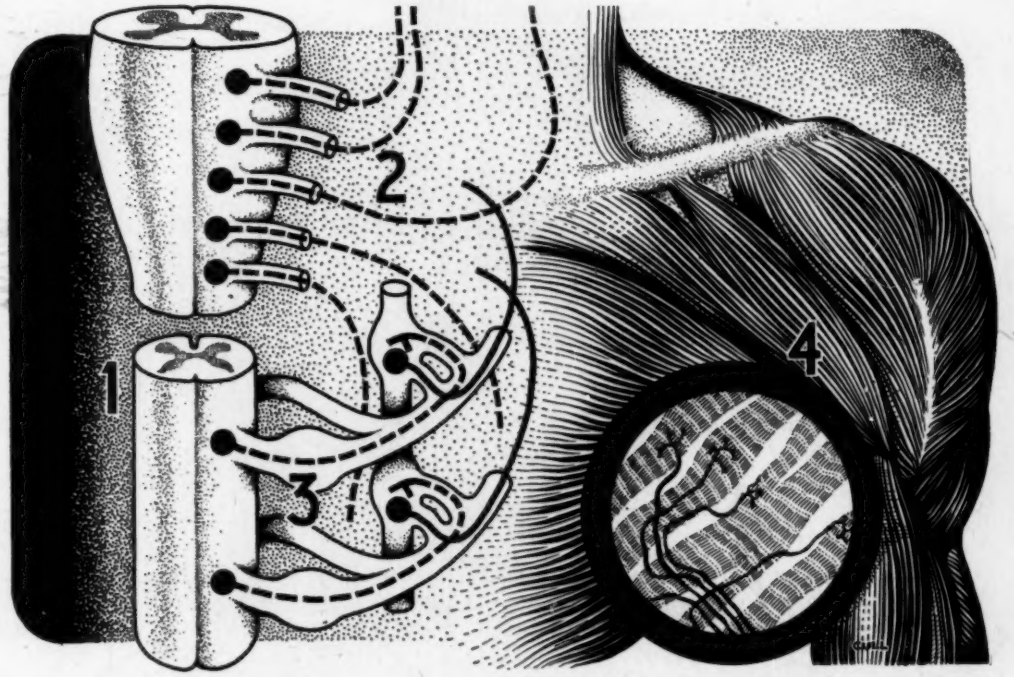
It is now being widely prescribed, with successful clinical results. Since a very small quantity is sufficient for each application, the cost of treatment is extremely low.

Salicylic acid tetrahydrofurfuryl-ester	14%
Nicotinic acid ethyl-ester	2%
Nicotinic acid n-hexyl-ester	2%
p-Aminobenzoic acid ethyl-ester	2%
Water-miscible cream base ad	100%

Transvasin is available in 1 oz. tubes, basic price 2/6 plus 7½d P.T., and is not advertised to the public. Samples and literature will be gladly sent on application.

LLOYD-HAMOL LTD., 11 Waterloo Place, London, S.W.1 WHItehall 8654/5/6

Transvasin is the registered trade mark of Lloyd-Hamol Ltd.



a new cholinergic compound by Roche

'MESTINON'

TRADE MARK BRAND

dimethyl carbamic ester of 1-methyl-3-hydroxy-pyridinium bromide

THE ILLUSTRATION

Represented are four sites at which acetylcholine occurs

1 The central nervous system
2 Parasympathetic motor fibres
3 Sympathetic ganglia
4 The motor end plates of voluntary muscle

Because 'Mestinon' exerts its activity on the physiological process of acetylcholine activity it has a number of clinical uses.

INDICATIONS

Myasthenia gravis

Pregnancy test

Amenorrhoea

'Muscle spasm'

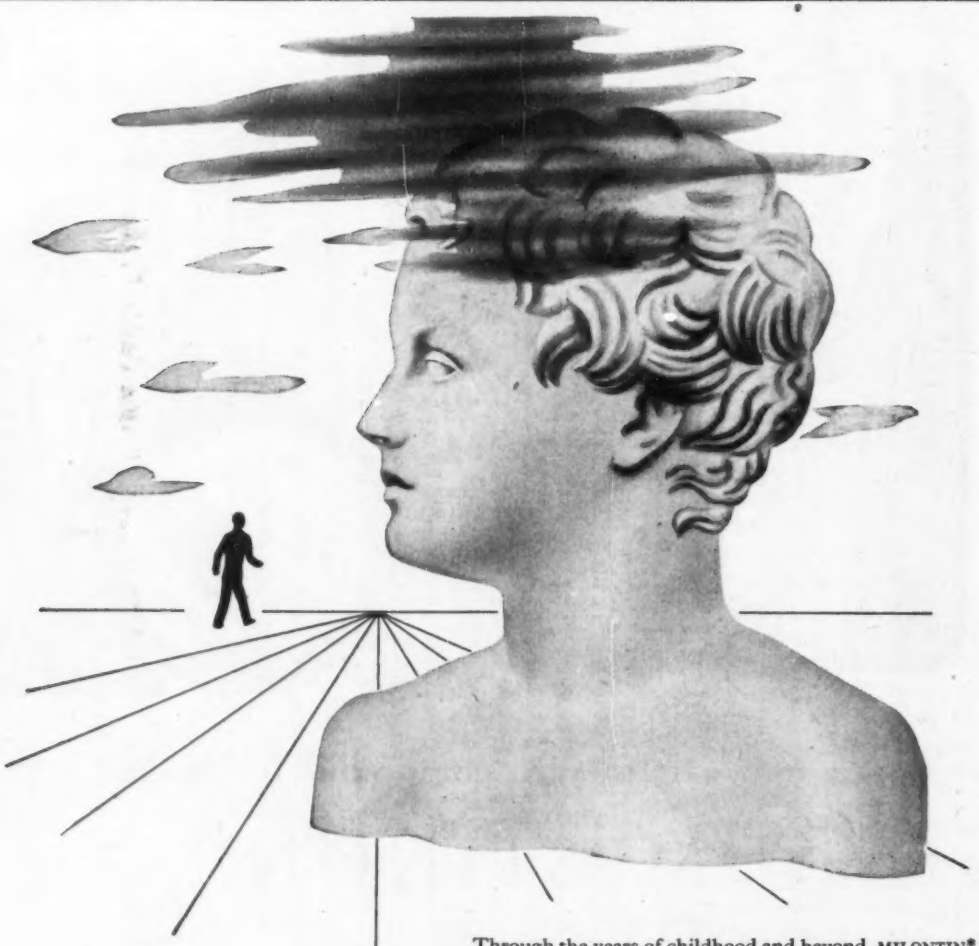
Curare antidote

PACKINGS

Tablets in bottles of 25, 150 and 500 Ampoules (1 mg. in 1 c.c.) in boxes of 6 and 50
Concentrated solution 5 c.c. (5 mg. in 1 c.c.) rubber capped phials

ROCHE PRODUCTS LIMITED, 15 MANCHESTER SQUARE, LONDON, W.1

9



smoothing the way ahead

Through the years of childhood and beyond, MILONTIN* brings powerful anti-convulsant action to sufferers from *petit-mal*. Milontin has been shown to reduce considerably the frequency of attacks in the majority of cases and to completely control them in many. An associated improvement in both mental and physical activity is often seen. In use, it is rapidly absorbed, well tolerated and relatively non-toxic. A product of the PARKE-DAVIS Research Laboratories, MILONTIN is being recognised as one of the most effective anti-convulsants for the treatment of petit-mal epilepsy.

Milontin

for Petit-mal Epilepsy

**Trade Mark*

Milontin Capsules, 0·5 g. each, in bottles of 50 and 500.

PARKE, DAVIS & COMPANY LIMITED *(Inc. U.S.A.)* Hounslow, Middlesex. *Tel: Hounslow 2361*

630

The ox bile salts, sodium taurocholate and glycocholate, are present in a tablet of Veracolate to the amount of 1.07 grains. The official dose of bile salts is 2 to 6 grains, and the recommended dose of 3 tablets daily therefore places Veracolate in the officially recommended therapeutic range. Veracolate stimulates the secretory activity of the liver and is used in chronic cholecystitis, "liverish" and "bilious" attacks, and constipation.

FORMULA
Sodium taurocholate & glycocholate, each 1.07 gr., ext. cascara sagrada, 1.00 gr., phenolphthalein 0.50 gr., oleoresin capsicum 0.04 gr.
PACKING:
Bottles of 50 & 100 tablets; bottles of 500 tablets for dispensing purposes only, at 15/-, not subject to P.T

Veracolate

No Warner preparation has ever been advertised to the public.

WILLIAM R. WARNER & Co. Ltd.,
Power Road, London, W.4.

*Terramycin S F

BRAND OF OXYTETRACYCLINE WITH VITAMINS

*Tetracyn S F

BRAND OF TETRACYCLINE WITH VITAMINS

to fight infection,

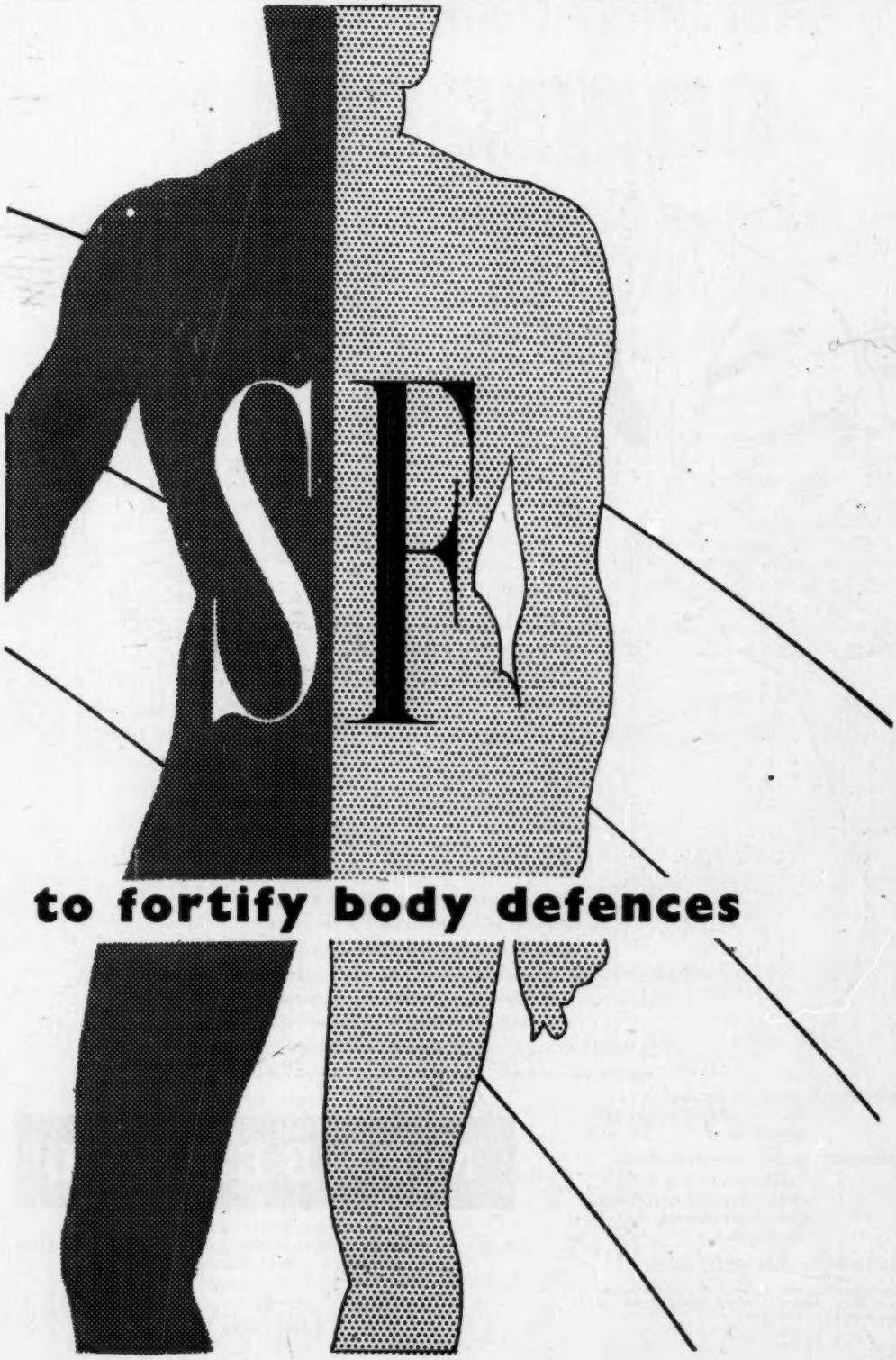
TERRAMYCIN S.F. and TETRACYN S.F. capsules provide in addition to the average daily adult dose of each antibiotic (1.0 g.) the specific therapeutic dosage of water soluble vitamins as well as vitamin K:

ASCORBIC ACID 300 MG. · THIAMINE MONONITRATE 10 MG.
RIBOFLAVIN 10 MG. · NICOTINAMIDE 100 MG. · MENAPHTHONE 2 MG.
(VITAMIN K ANALOGUE)

WORLD'S LARGEST PRODUCER OF ANTIBIOTICS Pfizer

PFIZER LIMITED FOLKESTONE KENT

*TRADE MARK CHAS. PFIZER & CO. INC.


SF
to fortify body defences

It is becoming customary to recognize nervous dyspepsia as a syndrome in its own right, and one which benefits from administration of the antispasmodic 'Merbentyl'. 'Merbentyl' has both neurotropic and musculotropic effect upon smooth muscle of the gastro-intestinal and genito-urinary tracts. It gives excellent results in the treatment of functional gastro-intestinal disorders and in the relief of painful spasm due to organic gastro-intestinal disease. Compared with other antispasmodics, both natural and synthetic, 'Merbentyl' is strikingly free from side-effects.

MERBENTYL *Tablets each containing 10 mg. Diethylaminocarbethoxybicyclohexyl hydrochloride.*

MERBENTYL WITH PHENOBARBITONE *Tablets each containing 10 mg. Diethylaminocarbethoxybicyclohexyl hydrochloride and 15 mg. (gr. ¼) Phenobarbitone.*

Each in bottles of 50 and 250 tablets.

Merbentyl Plain and Merbentyl with Phenobarbitone (each 5 c.c. containing 15 mg. Phenobarbitone) are also available in Syrup form.

MERBENTYL

distributed in the United Kingdom & Eire by
RIKER LABORATORIES LIMITED, LOUGHBOROUGH, LEICS.
for the Wm. S. Merrell Company, London.

Merrell research

A new capillary haemostatic

ADRENOXYL

for medical and surgical conditions

Clinically proven to reduce bleeding-time without effect on coagulation or blood pressure, and to have no undesirable side effects

ADRENOXYL, a product of original research, reduces the mean bleeding-time by decreasing the permeability and increasing the contractility and resistance of the capillaries. Its effectiveness in diminishing blood loss has been demonstrated by clinical studies.

ADRENOXYL has no effect on coagulation. It neither increases nor decreases blood pressure.

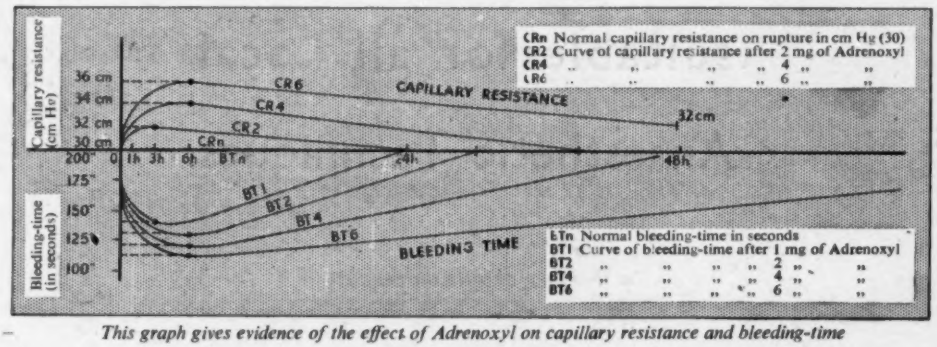
ADRENOXYL is non-toxic, and there are no contra-indications to its use.

ADRENOXYL is indicated in the preventive and curative treatment of all types of capillary bleeding.

ADRENOXYL has been successfully used to diminish capillary bleeding in a wide range of surgical operations, and has proved particularly useful in ear, nose, and throat surgery, ophthalmic surgery, thoracic surgery, gastro-intestinal surgery, plastic surgery and urogenital surgery. It has also been used successfully in many medical conditions associated with capillary haemorrhage or where capillary fragility is a feature.

ADRENOXYL may be administered by mouth or by subcutaneous or intramuscular injection. The oral form is for routine treatment, though when rapid action is desired the intramuscular route is recommended.

ADRENOXYL is now available in boxes of 6 or 50 ampoules: tubes of 25 tablets or bottles of 500 tablets.



This graph gives evidence of the effect of Adrenoxyl on capillary resistance and bleeding-time

BIBLIOGRAPHY

Observations cliniques sur l'action hémostatique de l'Adrénoxyl.
Ars. Medici 1948, 3, 57

L'Adrénoxyl comme hémostatique en otorhinolaryngologie
Ars. Medici 1949, No. 4, 295

La semicarbazone de l'adrénochrome.
Sem. Hôp. 1950, 26, 3347

Recherches cliniques sur l'action hémostatique, dynamogène et vitaminique P de l'adrénochrome (Adrénoxyl).
Praxis 1951, 40, 713

Zur Frage der Blutungsprophylaxe bei Bulbuseröffnenden Operationen.
Schweis. Med. Wock. 1952, No. 17, 484

La semicarbazone de l'adrénochrome: hémostatique biologique à action tissulaire.
Rev. Stomat. 1947, 48, 616

Hémostase on chirurgie plastique, emploi de la monosemicarbazone de l'adrénochrome.
Rev. L.O.R. 1948, 380.

Literature and samples on request.

HORLICKS LIMITED
Pharmaceutical Division, Slough, Bucks.

XYLOCAINE*

the original brand of lignocaine

THE LOCAL ANAESTHETIC

—Product of Original Research

XYLOCAINE is available in packings and preparations suitable for all Local Anaesthetic Techniques.

Further details on request

DUNCAN, FLOCKHART & CO., LTD.

SPECIALISTS IN ANAESTHETICS

EDINBURGH LONDON

**Regd. Trade Mark.*

Manufactured under Licence from A.B. Astra, Sodertalje, Sweden

In Allergic Conditions

CALCIUM-SANDOZ

(*calcium glucono-galacto-gluconate*)

is a useful alternative to treatment with antihistamine drugs. Furthermore, the parenteral and oral administration of Calcium-Sandoz combined with an antihistaminic has been reported to elicit good results in cases where the use of an antihistaminic alone proved to be of no avail. (*Int. Arch. Allergy, N.Y.*, 1952, **3**, 67.)

★ **Urticaria (acute and chronic)**
★ **Drug eruptions**
★ **Hay-fever**
★ **Bronchial asthma**
★ **Post-transfusion reactions**

Literature and samples available on request

SANDOZ

SANDOZ PRODUCTS LIMITED

134, Wigmore Street, London, W.1

NEW CORTISONE DERIVATIVE

DECORTISYL

Δ_1 — dehydrocortisone *

ROUSSEL

ROUSSEL LABORATORIES

manufacturers of CORTISYL and HydroCORTISYL have pleasure in introducing the new cortisone derivative — DECORTISYL.

It is characterised by maximal anti-inflammatory and anti-rheumatic effect, and minimal sodium retention.

DECORTISYL *is presented in 5 mg. tablets.*

An announcement regarding distribution of this product will be made shortly on completion of discussion with the authorities concerned, but initial quantities are at the disposal of research centres.

* Also known as metacortandracin.

ROUSSEL LABORATORIES LIMITED, 847 Harrow Road, London, N.W.10.

NEW NON-BARBITURATE HYPNOTIC

Doriden

α-phenyl-α-ethyl glutarimide

SAFE ROUTINE TREATMENT FOR

Insomnia

RAPID ACTION, MEDIUM DURATION

FREE FROM "HANGOVER" EFFECTS

Tablets of 0.25 g. in bottles of 25, 100 and 500

CIBA

'Doriden' is a registered trade mark. Reg. user

CIBA LABORATORIES LIMITED, HORSHAM, SUSSEX

Telephone: Horsham 1234 Telegrams: Cibalabs, Horsham

1/5

New approach to

CORTISONE MANUFACTURE

CORTISONE, one of the most complicated of the synthetic organic compounds yet introduced into medical practice, has now been totally synthesised by Glaxo Laboratories in this country using a new process devised jointly with the National Institute for Medical Research. This new development utilises, as starting material, hecogenin derived from East African sisal waste. The synthesis is therefore of practical importance to the National economy because it avoids the need for dollar imports. At the same time it promises more plentiful supplies of this important drug for the National Health Service and for Britain's overseas customers.

THE new method of manufacture is being put into full production scale and, from start to finish, Cortelan (cortisone Glaxo) is now being made in the United Kingdom from materials produced in sterling areas.

GLAXO

Glaxo cortisone preparations in U.K. are supplied only to hospitals, on Ministry of Health tender.

Information about ***both Cortelan*** *(cortisone) and Efcortelan (hydrocortisone) is available on reference filing cards, a set of which can be sent at your request.*

GLAXO LABORATORIES LIMITED, GREENFORD, MIDDLESEX, ENGLAND

A H

summer hazards

The warmer months of the year provide conditions suitable for the multiplication of bacteria on contaminated food and for the spread of contamination by flies; it is then that epidemics of bacterial food poisoning, bacillary dysentery and summer diarrhœa of infants are most frequent and widespread.

The organisms commonly responsible for such epidemics are sensitive to the combined action of streptomycin and sulphaguanidine.

The use of Guanimycin will rapidly eliminate the infecting organism and reduce the number of convalescent carriers.

GUANIMYCIN

Oral streptomycin sulphate with sulphaguanidine

In bottles to prepare 4 fluid ounces.

Literature on application.

ALLEN & HANBURYS LTD · LONDON · E·2

TELEPHONE: BISHOPSGATE 3201 (20 LINES). TELEGRAMS: GREENBURYS BETH. LONDON

RAUWILOID

a purified and biologically tested extract of . . . . RAUWOLFIA SERPENTINA

RAUWILOID is not the crude Rauwolfia root. Rauwiloid represents the total hypotensive activity of pure whole Rauwolfia serpentina root, freed from inert matter and the undesirable side-effects of the yohimbine type alkaloids.

RAUWILOID is not merely a single alkaloid of Rauwolfia. Rauwiloid provides the balanced action of the several potent alkaloids in Rauwolfia.

RAUWILOID contains besides reserpine other active alkaloids such as Rescinnamine* reported to be equally hypotensive but less sedative than reserpine.

RIKER

indications

Rauwiloid presents Rauwolfia in its optimal form for the treatment of essential hypertension. In severe, malignant cases its greatest value lies in its ability to ameliorate the side-effects of the more potent anti-hypertensives.

Dosage is simple—two tablets nightly.

* *References:*

Proc. Soc. exp. Biol., N.Y. (1954) **86**: 120.
Amer. Chem. Soc. (1954) **76**: 2843.

Detailed literature will be gladly sent on request.

'RAUWILOID' is a Registered Trade Mark. Regd. Users:

RIKER LABORATORIES LIMITED
LOUGHBOROUGH LEICS. ENGLAND

effective

local antibiotic therapy—with minimal risk of sensitisation

'POLYFAX' combines 'Aerosporin' brand Polymyxin B Sulphate with Bacitracin in a new antibiotic ointment of *very wide antibacterial range*. 'Polyfax' has a prominent place in clinical practice because

- **Polymyxin is lethal to many gram-negative organisms, particularly *Ps. pyocyanea*.**
- **Bacitracin is effective against gram-positive organisms.**
- **Drug resistance to polymyxin is unknown, to bacitracin very rare.**
- **Penicillin-resistant strains often succumb to bacitracin.**
- **Risk of skin sensitisation is minimal.**
- **Local absorption is insignificant.**
- **Subsequent systemic use of antibiotics is not prejudiced.**
- **'Polyfax' is so formulated that its antibiotic components are stable and readily diffusible.**

'POLYFAX' is non-irritating and may be applied for long periods if necessary. It is available in tubes of 20 gm. for topical application and as 'Polyfax' brand Ophthalmic Ointment in tubes of 4 gm. with special nozzle.

'POLYFAX' BRAND Ointment

BURROUGHS WELLCOME & CO. *(The Wellcome Foundation Ltd.)* LONDON

You can have absolute confidence in

LONDON HOSPITAL CATGUT

With L.H.C. you can safely use the finest gauge suited to the operation. Finer gauges mean less scar tissue and quicker healing. The tensile strength of all gauges of London Hospital Catgut is higher than that of the standards prescribed by the B.P.

specify L·H·C for strength

Neophryn

with Antihistamine —for hay fever

NEOPHRYN, now reinforced with antihistamine,* brings symptomatic relief quickly . . . safely to adults suffering from uncomplicated hay fever. Delivered as a fine spray by the convenient plastic atomizer, this powerful combination focuses its decongestive activity on blocked nasal cavities without any undesirable side-effects. In the absence of a cure for hay fever, it is indeed just such properties that make NEOPHRYN with ANTIHISTAMINE a perfect prescription for short-term local treatment.

**thenyldiamine hydrochloride*

Neophryn

Trade Mark

NASAL SPRAY WITH ANTIHISTAMINE

Also available without antihistamine as drops and spray

BAYER **PRODUCTS LIMITED · Neville House · Kingston-on-Thames · Surrey**

Associated export company: WINTHROP PRODUCTS LIMITED

THE MICRO-ENVIRONMENT OF INFLAMMATION or METCHNIKOFF REVISITED *

RENÉ J. DUBOS
M.D., Sc.D., Ph.D.
MEMBER OF THE ROCKEFELLER INSTITUTE FOR MEDICAL RESEARCH, NEW YORK, N.Y.

IN a lecture entitled "Forces curatives de l'organisme" delivered before a group of physicians and naturalists in Odessa in 1883, Metchnikoff compared the leucocytes to "an army hurling itself at the enemy." He had created the word "phagocyte" to express his belief that the leucocytes could digest the micro-organisms that they engulfed—a power that he regarded as essential to their ability to protect against infection.

Metchnikoff developed further his personal interpretation of the inflammatory process and presented it as a general biological theory in his *Lectures on Comparative Pathology of Inflammation* published in French in 1892 and in English in 1893. The first lecture contains the startling statement that "the most characteristic features" of the organisation of living things are "their organs of attack and defence." "The parasite makes its onslaught by secreting toxic or solvent substances, and defends itself by paralysing the digestive and expulsive activity of its host; while the latter exercises a deleterious influence on the aggressor by digesting it and turning it out of the body, and defends itself by the secretions with which it surrounds itself." As Metchnikoff believed that "there is but a short step from active aggression to infection" it was natural for him to regard the activities of inflammatory cells as purposefully designed to protect the body against microbial parasites.

Metchnikoff was not a pathologist, nor even a physician. He knew little if anything of pathological processes in higher animals and man when he first formulated the phagocytic theory, and immediately became an easy target for criticism. There is no doubt that most of the objections that were levelled against him were justified, but nevertheless his theory became and remains today one of the most creative forces in the field of pathology. It is not without interest therefore to review the way in which the phagocytic theory has evolved into a sophisticated concept of host-parasite relationship.

The critics pointed out that to regard the inflammatory response as a sort of mobilisation, and the phagocytes as a police force, implied a teleological view of living processes philosophically untenable. Although valid in principle, this objection has lost much of its punch today, since it is generally accepted that both the cellular and humoral components of inflammation constitute adaptive responses having survival value for the species. In fact, Metchnikoff himself had clearly stated that his theory was "based on the law of evolution according to which the properties that are useful to the organism survive, while those which are harmful are eliminated by natural selection." Indeed, there exists today a large body of experimental and clinical observations demonstrating that procedures and events which interfere with the inflammatory response usually decrease thereby resistance to infection. It is certain that, in general, the final result of the inflammatory process is to antagonise the irritant and facilitate healing.

More constructive was the opposition to Metchnikoff voiced by those who held that the real determinants of resistance to infection are not the phagocytes, but rather humoral factors such as antibodies, complement, and the various antimicrobial substances of tissues and body-fluids. Here again, time and increased knowledge have softened the harshness of this controversy. It is clear on the one hand that acquired immunity often depends upon the simultaneous participation of both cellular and humoral factors. And we shall see furthermore that many of the soluble antimicrobial substances of body-fluids are in reality secreted by the cells or released from them as a result of necrosis, and are concentrated at the site of the lesion by the inflammatory process.

The third order of objection is by far the most important. Pathologists had observed the uptake of bacteria by white blood-cells long before Metchnikoff redescribed the phenomenon under the name phagocytosis. But, far from regarding phagocytosis as a defence mechanism, the early observers thought that the phagocytic cells acted as vehicles for the bacteria that they ingested, facilitating their dispersal through the tissues, and thus contributing to the spread of infection. As stated by Ziegler in 1892, "In certain cases phagocytosis may help to destroy the foreign bodies. In other cases however it may contribute to the generalisation of infectious disease—e.g., when the bacteria can multiply within the cells, as in leprosy, or when they are carried about by the cells." [10] Many facts are now available to support this point of view. All viruses and bacteria, as well as many (perhaps most) pathogenic bacteria and protozoa find in the intracellular environment conditions that protect them against many noxious influences and favour their multiplication. Thus, Metchnikoff's conceptual scheme is certainly an oversimplification, which bears little resemblance to the majority of infectious processes in higher animals and man.

While it is true that phagocytosis cannot be equated with resistance to infection in the terms of Metchnikoff's oversimplified formula, there is much evidence nevertheless that inflammatory cells play a dominant rôle in this respect, but through very indirect mechanisms. A. A. Miles has suggested, for example, that phagocytes transfer the micro-organisms that they ingest to other cells of the reticulo-endothelial system possessing greater bactericidal power. On the other hand, it appears likely, as we shall presently see, that inflammation creates in and around the infected focus a micro-environment unfavourable to the multiplication and even to the survival of most microbial agents.

Needless to say, many factors other than cells contribute to creating this micro-environment—for example, the nervous and chemical influences which control the behaviour of the vascular bed and thereby determine the composition of the fluid and gaseous atmosphere of the lesion. Without losing sight of the complexity of the physiological, chemical, and physical characteristics of the inflammatory area, I shall focus my discussion on two special mechanisms through which cellular elements probably affect the course of infection—namely, the release in the lesion of substances possessing antimicrobial activity, and the creation of a metabolic environment different from that of the physiological *milieu intérieur*.

It must be emphasised here that the same factors and events which antagonise the activity of microbial agents not infrequently cause damage to the host cells. In other words, the protective effect exerted by the inflammatory response is often achieved at the cost of toxic reactions or tissue destruction. Metchnikoff visualised the defensive battle against infection as being fought by white blood-cells "hurling themselves" at the microbial invaders. In many cases, however, it appears that the body can arrest the spread of microbial disease only by practising a "scorched earth" policy.

Cellular Components Possessing Antimicrobial Activity

Although there is incontrovertible evidence that the cells of certain microbial species are rapidly destroyed

* University of London lecture delivered at the London School of Hygiene and Tropical Medicine on April 28, 1955.

in the intracellular environment of phagocytes, the mechanism of this killing effect is still unknown and indeed has been little studied. Any theory of the process must account for the fact that the bactericidal power of leucocytes is highly selective, certain bacteria surviving for long periods of time, and others multiplying extensively, in the very type of cells capable of killing closely related organisms. Suffice it to mention as illustration of this selectivity that coagulase-positive staphylococci multiply within polymorphonuclear leucocytes in vitro, whereas the coagulase-negative strains die immediately. Even more puzzling is the contrast in susceptibility between the Friedländer bacillus, a "sturdy" organism which is rapidly killed in these cells, and certain delicate gram-negative bacilli like brucella which give rise to intracellular infections. Let it be stated outright that no explanation can yet be offered for these differences in behaviour. The most that can be done at the present time is to review some of the properties of phagocytic cells which may have a bearing on their bactericidal power.

Early in the development of his theory, Metchnikoff had pointed out that the act of phagocytosis often results in an acidic reaction within the phagocytic vacuole in certain types of cells (but not in all). He also suggested that the leucocytic enzymes acted as "cytases," capable of attacking and digesting the microbial cells. We shall postpone the discussion of the possible bearing of the acid reaction within the vacuole on the fate of engulfed micro-organisms, and turn now to the bactericidal effect of leucocytic enzymes.

Leucocytic Enzymes and Products

It has been repeatedly shown that leucocytes contain a variety of proteolytic enzymes which readily attack the cellular structures of dead microbial agents; but, as far as is known, ordinary proteases are unable to affect the viability of living bacteria or the infectivity of filterable viruses. The fact however that certain cathepsins can kill parasitic worms as well as tissue cells suggests that there is need for renewed investigation of the bactericidal and viricidal power of proteolytic enzymes. Among known enzymes only one—lysozyme—can be considered to belong to the group of cytases postulated by Metchnikoff. As is well known, lysozyme is an acetylamino polysaccharidase which causes the lysis of certain living bacteria probably by attacking a structural component of their cell wall. Few are the bacterial species the living cells of which are lysed by this enzyme; but many are those susceptible to its bacteriostatic activity. For example, lysozyme inhibits the growth of many mycobacteria although it does not cause their lysis. Of particular interest is the fact that granulocytes are very rich in lysozyme. Recent experiments reveal that polymorphonuclear extracts contain an enormous amount of lysozyme, approximately 1 mg. per ml. of packed cells.[21] Moreover the enzyme is readily released from granulocytes in an active form, and for this reason accumulates in certain inflammatory areas. It might be of interest therefore, to investigate again the range of antimicrobial activity of lysozyme at the concentration and under the conditions prevailing in these areas.

There are many reports describing the existence in leucocytic extracts of fractions other than lysozyme possessing a direct bacteriostatic or bactericidal activity. But in general the active materials have not been identified chemically, nor their rôle in vivo demonstrated. I shall select for discussion one group of substances rarely thought of in relation to leucocytes—namely the hæm compounds. Though it has long been known that hæms possess antibacterial activity in the free state, they appear to be inactive from this point of view when in combination with proteins. On the other hand, circumstances which cause a dissociation of hæms from their protein complexes and thus release their potential antibacterial activity certainly occur in the body. Hæmoglobin, for example, becomes bactericidal when exposed to reactions acidic enough to permit dissociation of hæm from the protein complex.[5] As we shall see later, acidity of this order may exist in the vacuole immediately after phagocytosis. Hæms can also be released free as a result of proteolytic destruction of the proteins with which they are combined. It is of interest in this respect that the pigment of green pus is due to the presence in leucocytes of very high concentrations of verdoperoxidase.[1] As it is likely that this conjugated protein is enzymatically attacked in the course of the autolytic processes associated with inflammation and necrosis, its hæm component may contribute to the destruction of bacteria in certain types of abscesses.

Products of Necrosis

Lysozyme and verdohæmoglobin provide two examples of substances which are concentrated in inflammatory areas by migratory cells, and released in the free state as a result of necrosis. It is not unlikely that necrosis can also bring about the local concentration of a large variety of other substances possessing antimicrobial activity. There are indications for example that some of the components essential for the antimicrobial activity of complement are released at the site of cellular injury. The possible importance of this fact is brought out by recent studies with *Salmonella typhimurium* and *Escherichia coli*. These organisms exist in several forms apparently identical in antigenic structure but differing markedly in virulence, some (virulent) causing progressive disease and death, others (attenuated) giving rise only to abortive infections. Although the attenuated bacilli are capable of multiplying in the mouse, the infection that they cause is short-lived. After a short initial period of proliferation, they rapidly decrease in numbers (whereas virulent bacilli continue to multiply) as if infection called into play some tissue mechanism bactericidal for the attenuated but not for the virulent forms.[17 18 26] In this regard, it has been found that the attenuated variants of both *S. typhimurium* and *Esch. coli* are highly susceptible in vitro to the bactericidal action of some humoral factor to which the virulent forms are resistant. This fact has led to the suggestion that the bacteriostatic factor—which appears to be identical or associated with complement—is released when the bacteria have multiplied extensively enough to produce lesions and necrosis. In other words it appears that inflammation changes the local environment in such a manner as to render it incompatible with the continued proliferation of microbial agents susceptible to complement-like substances.

Necrosis can also result in the production of basic peptides possessing antimicrobial activity. Several of these have been separated from animal tissue by different techniques of extraction and purification; they differ in amino-acid composition and in their activity against various bacteria and viruses.[5 6 23] Unpublished findings from our laboratory suggest that the peptide fraction active against tubercle bacilli does not exist preformed in a free state in the tissue, but appears only as a result of autolytic changes. This observation may add significance to a recent report describing the separation from tuberculous lymph-nodes of a heat-stable substance possessing antimycobacterial activity.[26] As the material could not be recovered from normal lymph-nodes and could hardly be an antibody because of its resistance to heat, there is a likelihood that it was a product of the inflammatory and necrotic reactions associated with the local infectious process.

The fact that the antimicrobial activity of the basic peptides is antagonised by a number of biological substances of common occurrence in vivo might be thought to militate against their ability to exert a protective rôle against infection. It seems likely, however, that necrosis

brings about the release of the peptides from more complex organic structures (nucleoproteins for example) precisely in the immediate environment of the micro-organisms responsible for the necrotic effect. Under these conditions antimicrobial activity could manifest itself locally in the lesion with minimum interference from other tissue constituents. Direct evidence that basic peptides can act in vivò is provided by the recent discovery that one of these substances, a synthetic polylysine, is active against certain virus infections in the chick embryo.[12]

It seems proper to conclude this unconvincing review of the activity of antimicrobial substances obtained from tissue cells with Metchnikoff's own words:

"I have always openly acknowledged that the question as to what substances within the phagocytes harm and destroy the microbes is still quite undecided. They may be ferments, digestive or otherwise, or they may be substances, acid or alkaline, completely different from ferments. We shall have to find new and more perfect methods before being able to solve this delicate problem." [10]

Physical and Metabolic Characteristics of the Inflammatory Environment

The production and local concentration of substances capable of inhibiting microbial agents is the most obvious mechanism through which the inflammatory response can exert a protective effect against the spread of infection. But it is not necessarily the most important, for, as we shall see presently, inflammation changes the physicochemical environment of the lesion in such a manner as to render it unfavourable to the multiplication and even the survival of the parasites.

Consider for example the influence of the deposition of fibrin and collagen at the site of the lesion. It appears at first sight that the main effect of this tissue response is to wall off the lesion mechanically. However, there is little doubt that membranes of fibrin or collagen have selective-permeability properties and thereby influence locally the composition of the fluid and gaseous environment.[4 13] Furthermore, it has been recently shown that fibrous structures greatly facilitate the engulfment of micro-organisms by providing conditions favourable for surface phagocytosis—whereas engulfment of many pathogenic agents proceeds only slowly if at all in a fluid environment.[29] Compatible with this view is the fact that destruction of fibrin by streptokinase prevents ingestion of encapsulated pneumococci in the absence of specific antibody.[3]

Acidity

Perhaps more important than the physical characteristics of the lesion are those which determine its metabolic peculiarities. Some of these could be anticipated from Metchnikoff's discovery that litmus granules change from blue to red in the phagocytic vacuole of certain types of cells. Other investigators have confirmed that a burst of intracellular acidity often follows phagocytosis, and evidence has even been adduced that it can bring the reaction of the vacuole contents to a very low pH.[24] The source of energy used in phagocytosis is probably glycogen which yields lactic acid through glycolytic fermentation.[3]

It seems probable that the high acidity of the phagocytic vacuole plays some part in the destruction of ingested micro-organisms. Metchnikoff suggested that acidity did activate an endocellular pepsin-like enzyme (cytase) which he thought might be responsible for the bactericidal effect; but, as already mentioned, no enzyme (other than lysozyme) capable of attacking living bacteria has yet been identified. On the other hand, recent in-vitro experiments have revealed that many types of microbial agents are killed within a few minutes after exposure to acid media containing lactic acid.[5] The pH range and the concentration of lactic acid at which the killing effect occurs in vitro are not unlike those that can be expected to prevail in the intracellular environment after phagocytosis.

The glycolytic activity of inflammatory cells also manifests itself in the biochemical characteristics of the extracellular environment. There is a long line of observations, consisting especially of measurements of titrable acidity, which indicate that the inflammatory area is markedly acidic—whether the initial irritant be a chemical substance, an allergic reaction, a microbial toxin, or the proliferation of a micro-organism. The early measurements indicating a titrable acidity corresponding to 100–200 mg. lactic acid per 100 ml. have been supplemented during recent years by the actual identification of this product of glycolysis through the use of specific manometric methods. The metabolic disturbances associated with inflammation have been studied also by inserting glass electrodes at different sites in the body and determining the local changes in pH that follow injection of various irritants.[11] In brief, it has been found that the irritation caused by certain chemical substances or micro-organisms brings about local increase in acidity. The local reactions may go down to pH 5·3 and remain below pH 6·0 for hours. It is obvious that much could be learnt concerning the course of biochemical events at the site of the lesion from a more extensive use of this simple technique. A few facts already established appear worth recording here because of their possible bearing on the infectious process.

Many factors affect the intensity and time course of the acid reaction. For example, treatment of laboratory animals with nitrogen mustard reduces markedly the production of lactic acid, apparently through its leucopenic effect.[27] In the normal animal, on the other hand, the inflammatory pH is lowered further by injection of glucose—a fact which may reflect an increase in the production of glycogen, since inflammatory cells use this polysaccharide as source of energy.[3] Whether or not the injection of bacteria causes a fall in local pH depends upon the amount of culture injected and the toxicity of the bacterial constituents. The acid reaction may fail to develop either because the bacterial product exerts a negative chemotactic effect and thus prevents the local accumulation of migratory cells, or because its toxicity interferes with glycolytic activity. It is of interest in this regard that toxigenic diphtheria bacilli inhibit the acid reaction, and that this inhibitory effect can be counteracted by a proper amount of diphtheria antitoxin.[11]

The acidity associated with the inflammatory process in the normal individual naturally has many secondary repercussions—for example, on the local CO_2 tension, on transmission of nerve impulses, on vascular permeability, and on the activity of antimicrobial drugs. I shall limit myself to a brief discussion of some of its direct effects on the microbial agents present in the inflammatory area.

It is well known of course that pathogenic bacteria and animal parasites are highly sensitive to acidity. Many viruses are also rapidly inactivated in media more acidic than pH 6·0. Indeed, recent experiments have revealed that the susceptibility of embryonated eggs to infection with influenza virus can be consistently increased by correcting with Mg CO_3 or other alkalis the acidity of the allantoic fluid.[9] It must be kept in mind, however, that the effect of acidity on living agents is less dependent on the pH, per se, than on the type of anions present in the environment. For example, experiments with animal cells and with bacteria make clear that lactic acid is much more toxic than either keto or polycarboxylic compounds, at any given acidic pH likely to be encountered in biological systems. There is evidence, furthermore, that the toxic effect of lactic acid on many bacteria increases with the CO_2 tension and under anaerobic conditions.[5]

Two recent publications provide indirect support for the view that the local biochemical environment may influence the course of the infectious process. In tissue-cultures, tubercle bacilli multiply more rapidly and more abundantly within macrophages when these phagocytic cells are sparse in the culture than when they are crowded.[19] This might be due to the fact that crowding decreases the availability of oxygen and the rate of exchange of metabolic products, thereby disturbing the metabolism of the macrophages and rendering their intracellular environment unfavourable to the bacilli. Another illustration of the influence of metabolic factors in the inflammatory area is provided by the fact that the growth of tubercle bacilli is inhibited within collodion bags placed in the peritoneal cavity of immune rabbits or guineapigs, even though tissue cells do not penetrate the collodion membrane.[16] I have presented elsewhere the hypothesis that, under these conditions, bacillary growth is inhibited by the acidic metabolites resulting from the inflammatory reaction rapidly called forth around the bags by the diffusible products of the bacilli that they contain.[5]

Cellular Immunity?

Needless to say, prior exposure to an infectious agent or immunisation against it calls into play mechanisms which enhance the protective effectiveness of the inflammatory reaction. But there is no evidence that acquired immunity utilises, for killing infectious agents or inhibiting their growth, any mechanism different in kind from those responsible for natural resistance. It has never been convincingly shown that antibodies by themselves possess bactericidal or bacteriostatic power; they merely sensitise the bacteria for phagocytosis or for attack by complement-like substances. True enough, there have been many claims supported by experimental evidence that "cellular immunity" endows the phagocytic cells with antimicrobial activities, different from those of normal cells. However, I believe—for reasons that cannot be discussed here—that all experiments, in vivo and in vitro, which are quoted to substantiate this concept are still sub judice, not necessarily as to the validity of the findings, but as to their interpretation. In contrast to these negative findings is the well-documented fact that the speed and the intensity of the inflammatory response to the presence of any infectious agent is much increased by specific acquired immunity. As a result, the liberation or concentration of substances endowed with antimicrobial properties, the creation of a physicochemical or metabolic environment unfavourable to microbial growth—all these anti-infectious mechanisms that we have considered in the preceding paragraphs, and many others not discussed here—are mustered very rapidly in the immune individual at the very site of infection, and make it difficult for the microbial agent to gain a foothold.

While prior exposure or immunisation thus accelerates and intensifies the operation of protective mechanisms in the inflammatory areas, there are many physiological disturbances which interfere with the normal processes of inflammation. I shall now turn to the effect of these disturbances on the course of the infectious process.

Effect of the General Physiological State on the Local Micro-environment of Inflammation

Physiological and metabolic disturbances in the infected individual must in many cases reflect themselves locally in some peculiarities of the inflammatory response and hence on resistance to infection. It is well known, for instance, that the enhancement of infection by overdoses of cortisone is an expression of the anti-inflammatory effect of this hormone; there is furthermore some evidence that cortisone causes alterations in the metabolism of tissue cells. Certain anti-histamines, when used in large doses in guineapigs, have also been found to interfere with the inflammatory response and thereby to allow local infections to become generalised.[13] Another example is provided by the discovery that the number of clostridia needed to establish fatal infection is very much smaller when these organisms are injected intradermally or intracutaneously along with small amounts of adrenaline than when physiological saline is used as diluent. Apparently, the very transient inhibitory effect exerted by the hormone on leucocytic and exudate infiltration is sufficient to facilitate infection and determine a fatal outcome.[8]

Many toxic substances (of microbial or other origin) can either destroy or immobilise inflammatory cells, or alter their chemical activities, and thereby contribute to loss of resistance to infection. In this respect, it is worth mentioning that injection of gram-negative toxins brings about a dramatic depletion in the glycogen reserves of the body, and that diphtheria toxin paralyses the cytochrome system, and lowers host reserves of energy-rich phosphorous compounds, presumably by inhibiting oxidative phosphorylation.

Among other physiological factors contributing to the loss of resistance should be mentioned the decrease in concentration of properdin in the serum. This serum protein practically disappears within a few days as a result of excessive irradiation, or in certain other pathological states, with a consequent loss of the bactericidal and viricidal power of complement.[23 24]

The Metabolic Background

The biochemical character of the lesion is necessarily dependent upon the over-all metabolism of the individual. Thus many factors, such as nutritional state, hormonal balance, and toxæmia, affect the synthesis and mobilisation of glycogen and thereby the glycolytic activity of inflammatory cells. On the other hand, fasting, uncontrolled diabetes, and other metabolic abnormalities, even of psychic origin, result in transient or lasting accumulation of acetone bodies which must in many cases find their way to, or be produced in, inflammatory areas. Although it can be surmised that biochemical disturbances influence the fate of the infectious agents through their effect on the pH of the lesion and its contents in various metabolites, only very indirect evidence can be quoted in favour of this assumption. The leucocytes of rabbits rendered alloxan-diabetic are still capable of engulfing pneumococci, but their bactericidal power for these bacteria is decreased.[22] Similarly in dogs put in a state of shock by extensive bleeding, the reticulo-endothelial system appears to retain for a time its ability to clear injected bacteria, but these eventually multiply as if the phagocytic cells were not capable of destroying the prey that they have engulfed.[10] In mice, we have found that several types of bacteria injected intravenously are rapidly killed in the liver, spleen, and lungs of normal animals, but persist and eventually multiply in the organs of animals fasted for 36–48 hours before infection; a similar interference with the bactericidal power of the organs can be achieved by treatment with dinitrophenol or thyroxine.[5 7] It is possible that these failures of the normal defence mechanism result from some biochemical injury to the phagocytic cells in the reticulo-endothelial system, and it does not seem too far-fetched to assume that phenomena of the same order occur in the inflammatory areas.

The same general concepts would seem to apply to the events that occur in established lesions when stresses of various sorts cause aggravation or reactivation of a dormant infectious process. There is evidence, for example, that the proteolytic activity of plasma can change rapidly and to an enormous extent in response to various physical, chemical, or even psychic stimuli. It is probable on the other hand that the activity of tissue proteases reduces in certain circumstances the deposition or persistence of fibrin, and perhaps even of collagen,

around the lesion. As already mentioned, this in turn may enhance the infectious process by decreasing the chances for surface phagocytosis and by facilitating the passage of particles and solutes to and from the lesion.

Metabolites and Bacteriostasis

The biochemical and toxigenic activities of the infectious agents are naturally affected by the nature and concentration of the metabolites that gain access to the lesion. Indeed, changes in the metabolic environment may even cause the reactivation of micro-organisms which have apparently lost their viability since bacteria inactivated with antiseptics or other injurious procedures have been made to multiply again by placing them in culture media containing intermediates of the Krebs cycle.[14] Two related observations are of special interest in this regard because of their bearing on events that may occur in vivo. Under the proper conditions, the bacteriostatic effect of lactic acid can be reversed by adding to the system certain polycarboxylic acids or keto compounds.[5] Even the bactericidal power of lysozyme and of other unidentified substances of serum is markedly antagonised by citric acid.[21] These few examples suggest that there can occur in vivo biochemical situations capable of bringing about reversal of bacteriostatic effects. In view of the fact that keto compounds and polycarboxylic acids accumulate in biochemical disorders associated with increased activity of infectious processes, it is perhaps of special interest that many cases of reversibility of bacteriostasis have been shown to be brought about by this group of metabolites. Granted that the examples here quoted were derived from information obtained in vitro, they suggest nevertheless that inhibition of infectious processes in vivo may often depend upon reactions which are potentially reversible. It seems possible that metabolic disturbances can cause reactivation of dormant infectious processes by upsetting these reversible mechanisms.

Conclusion

Through a number of different mechanisms arrived at by evolutionary adaptation, man has achieved some sort of ecological equilibrium with the micro-organisms that are ubiquitous in his environment. Indeed these micro-organisms may be harboured in the body without causing disease, and establish relationships with the tissues—covering the whole gamut from the commensalism and symbiosis represented by the flora of the gut, to the various types of arrested or latent infections. The factors which determine whether the microbial agents are thus held in check, or undergo unrestrained multiplication, are of course highly complex. Metchnikoff had identified resistance to infection with the ability of the leucocytes to engulf and destroy infectious agents. It seems now that this mechanism, even though supplemented by various humoral factors, operates in but a very few types of infections. I have presented the view that natural and acquired resistance depends more often upon the ability of the inflammatory response to create in and around the lesion a micro-environment inimical to the infectious agent.

It is likely that disturbances in the general state of health often bring about qualitative and quantitative changes in the biochemical characteristics of the inflammatory area. These in turn may interfere with the processes which control the activities of micro-organisms within the lesion. As a result, the response of the body to infection and consequently the micro-environment in which the infectious process follows its course, are under the control of factors which may be metabolic or psychic in origin. This concept accounts in part for the fact that susceptibility to infection can change independently of the immunological state of the infected individual. Since changes in susceptibility can occur rapidly, and be extremely transient, the intensity of exposure to an infectious agent may be less decisive than the physiological state of the exposed individual, in determining whether infection fails to take hold, becomes established, runs an abortive course, or evolves into overt disease.

REFERENCES

1. Agner, K. (1941) *Acta physiol. scand.* **2**, suppl. 8.
2. Balch, H. H., Spencer, M. T. (1954) *J. clin. Invest.* **33**, 1314.
3. Bazin, S., Delaunay, A., Avice, C. (1953) *Ann. Inst. Pasteur*, **85**, 774.
4. Day, T. D. (1954) *Brit. J. exp. Path.* **35**, 315.
5. Dubos, R. J. (1954) Biochemical Determinants of Microbial Diseases. Cambridge, Mass.
6. — Hirsch, J. G. (1954) *J. exp. Med.* **99**, 55.
7. — Smith, J. M., Schaedler, R. W. (1955) *Proc. R. Soc. Med.* (in the press).
8. Evans, D. G., Miles, A. A., Niven, J. S. F. (1948) *Brit. J. exp. Path.* **29**, 20.
9. Fauconnier, B. (1955) *Ann. Inst. Pasteur*, **88**, 96.
10. Fine, J. (1954) *New Engl. J. Med.* **250**, 889.
11. Frunder, H. (1951) Die Wasserstoffionenkonzentration im gewebe lebender Tiere—nach messungen mitder Glaselektrode. Jena.
12. Green, M., Stahmann, M. A., Rasmussen, A. F. (1953) *Proc. Soc. exp. Biol., N.Y.* **83**, 641.
13. Halpern, B. N., Dumas, J., Reber, H. (1949) *C.R. Soc. Biol. Paris*, **163**, 1563.
14. Heinmets, F., Taylor, W. W., Lehman, J. J. (1954) *J. Bact.* **67**, 5.
15. Hughes, W. H. (1948) *Brit. J. Exp. Path.* **29**, 173.
16. Lurie, M. B. (1939) *J. exp. Med.* **69**, 555.
17. Maaloe, O. (1948) *Acta path. microbiol. scand.* **25**, 236.
18. — (1948) *Ibid*, p. 755.
19. Mackaness, G. B., Smith, N., Wells, A. Q. (1954) *Amer. Rev. Tuberc.* **69**, 479.
20. Metchnikoff, E. (1893) Lectures on Comparative Pathology of Inflammation. London.
21. Myrvik, Q. N., Weiser, R. S. (1955) *J. Immunol.* **74**, 9.
22. Pillemer, L., Ratnoff, O. D., Blum, L., Lepow, I. H. (1953) *J. exp. Med.* **97**, 573.
23. Richardson, R. (1940) *J. clin. Invest.* **19**, 239.
24. Rous, P. (1925) *J. exp. Med.* **41**, 379.
25. Rowley, D. (1955) *Lancet*, **i**, 232.
26. Soltys, M. A. (1953) *J. comp. Path.* **63**, 147.
27. Stetson, C. A., Good, R. A. (1951) *J. exp. Med.* **93**, 49.
28. Watson, D. W., Bloom, W. (1952) *Proc. Soc. exp. Biol., N.Y.* **81**, 29.
29. Wood, W. B. (1951) *Harvey Lect.* **47**.
30. Ziegler, Quoted by Metchnikoff (ref. 20), p. 206.

POLIOMYELITIS AND TONSILLECTOMY

A REPORT OF THE MEDICAL RESEARCH COUNCIL COMMITTEE ON INOCULATION PROCEDURES AND NEUROLOGICAL LESIONS *

1. RECENT TONSILLECTOMY

SINCE early in 1951 all medical officers of health in England and Wales have submitted to the Medical Research Council a routine report on each person notified in their areas to be suffering from poliomyelitis. The reports stated whether the patient had undergone tonsillectomy within 12 months before the onset of symptoms and gave dates where relevant. Patients reported to have had their tonsils removed within 3 months before the onset of poliomyelitis were selected for special investigation, and one of three investigators—the secretaries and Dr. D. Thomson of the Ministry of Health—visited the medical officer of health who notified the case, the physician who was in charge of the patient in hospital, and, in many instances, the patient's general practitioner, and made a detailed record. This is a report of the information obtained about all patients in England and Wales up to the end of 1953 said to have had their tonsils removed within the 3 months before the onset of poliomyelitis.

Number of Cases

A total of 114 cases were reported in the three years. The oldest patient was aged 18 years. In 1 patient, whose

* The members of the committee are: Dr. G. S. WILSON (chairman), Dr. W. H. BRADLEY, Dr. E. A. CARMICHAEL, Dr. E. T. CONYBEARE, Prof. F. GRUNDY, Prof. A. BRADFORD HILL, Dr. F. O. MACCALLUM, Dr. W. RITCHIE RUSSELL, Mr. H. J. SEDDON, Dr. I. N. SUTHERLAND, Dr. I. TAYLOR, Dr. J. F. WARIN, and Dr. W. C. COCKBURN and Dr. J. KNOWELDEN (joint secretaries). The plans of the studies were prepared by the joint secretaries, who analysed the information and prepared the report.

TABLE I—POLIOMYELITIS AND RECENT TONSILLECTOMY: AGE AND SEX DISTRIBUTION OF CASES INVESTIGATED, 1951–53

Age (yr.)	Males	Females	Both sexes
2	2	1	3
3	11	2	13
4	8	8	16
5	19	11	30
6	13	10	23
7	6	1	7
8	3	2	5
9	..	1	1
10 and over	2	3	5
All ages	64	39	103

illness occurred in 1952, the exact interval between tonsillectomy and onset could not be established, although it was probably less than 3 months. This case has been excluded from the analysis, as have 9 cases where the diagnosis was changed or was doubtful, and 1 where the information was inadequate. The age and sex distribution of the remaining 103 confirmed cases for which full information was available is given in table I. They were classified according to the type of illness into 34 with spinal paralysis, 29 with mixed spinal and bulbar involvement, 27 with bulbar paralysis only, and 13 with non-paralytic illnesses.

Results

Table II shows the distribution of the cases according to the time interval between the operation and the onset of the earliest symptoms. There was a concentration of cases where operation was performed within the period of 1–21 days before onset, 61 (59%) out of the 103 having this short interval. The concentration was particularly pronounced in the group with bulbar involvement. In it were 23 (85%) of the 27 patients with bulbar paralysis only, and 21 (72%) of the 29 with mixed bulbar and spinal paralysis. The corresponding proportions were 13 (38%) of 34 with spinal paralysis only, and 4 (31%) of 13 in the non-paralytic group. The difference between the bulbar and bulbo-spinal groups in the proportions having had an operation within 3 weeks of onset was not significant ($\chi^2 = 1{\cdot}355$, d.f. 1, $p > {\cdot}2$). Amalgamated they form one group of 56 patients with bulbar paralysis, with or without further involvement. In this combined group 44 (79%) had tonsillectomy within three weeks before onset. This was just over twice the corresponding proportion in the patients with spinal paralysis only (38%), and the difference was significant ($\chi^2 = 14{\cdot}822$, d.f. 1, $p < {\cdot}001$). The non-paralytic group was small, but the proportion of patients with tonsillectomy within 3 weeks of onset was again very much smaller than in those with bulbar paralysis, and the difference was statistically significant ($\chi^2 = 11{\cdot}387$, d.f. 1, $p < {\cdot}001$). No real difference could be demonstrated between the proportion operated on within 21 days before onset in the non-paralytic group and the spinal-paralysis group ($\chi^2 = 0{\cdot}227$, d.f. 1, $p > {\cdot}5$).

TABLE II—POLIOMYELITIS AND RECENT TONSILLECTOMY: DISTRIBUTION OF CONFIRMED CASES IN ENGLAND AND WALES, 1951–53, BY TYPE OF ILLNESS AND INTERVAL FROM OPERATION TO ONSET

Interval from operation to onset (days)	Spinal		Bulbo-spinal		Bulbar		Non-paralytic		All forms	
1–7	3	13	5	21	3	23	1	4	12	61
8–14	4		11		16		2		33	
15–21	6		5		4		1		16	
22–28	3		2		1		3		9	
29–35	..		..		..		..		..	
36–42	2		1		..		1		4	
43–49	1		..		..		1		2	
50–56	1		2		1		..		4	
57–63	5		2		..		..		7	
64–70	3		..		..		..		3	
71–77	3		..		..		1		4	
78–84	2		..		..		1		3	
85–91	1		1		2		2		6	
All intervals	34		29		27		13		103	

An alternative way of expressing the results would be to say that of the 61 patients who developed poliomyelitis within 3 weeks after tonsillectomy 38% had bulbar paralysis only and 34% had bulbar and spinal paralysis, against 21% with spinal paralysis only and 7% with no paralysis. On the other hand, in the 42 patients whose tonsillectomy preceded the onset of their illness by more than 3 weeks the corresponding proportions were 10% bulbar, 19% bulbo-spinal, 50% spinal, and 21% non-paralytic. There was, therefore, a concentration of patients exhibiting bulbar manifestations when the interval from operation to onset was short.

If there were no seasonal fluctuation in the frequency with which tonsillectomy was performed throughout the country and if the operation and the subsequent illness were only coincidentally related, then it might be expected that as many cases would be found with an interval between the events of 1–7 days, as 8–14 days, 15–22 days, or any subsequent week within the arbitrarily chosen 3 months. However, for some years it has been the practice of many ear, nose, and throat surgeons to limit the number of tonsillectomies they perform in the late summer months or when poliomyelitis is epidemic in their own districts. This, together with the seasonal pattern of the disease, would distort the distribution of intervals between operation and onset even if there were no association between the events, and the form of the distribution would depend on the relationships between the time trend of tonsillectomy and of the epidemic. Since the frequency of tonsillectomy week by week is unknown it is impossible to base any sound arguments about the possible association between operation and illness on the distribution of time intervals between the two events in any one group of patients. The apparent concentration of short intervals in the spinal group, therefore, may be purely coincidental.

TABLE III—POLIOMYELITIS AND RECENT TONSILLECTOMY: DISTRIBUTION OF INTERVALS FROM TONSILLECTOMY TO ONSET BY TYPE OF ILLNESS AND SEX

Interval from operation to onset (days)	Males			Females		
	Non-paralytic	Spinal	Bulbar and bulbo-spinal	Non-paralytic	Spinal	Bulbar and bulbo-spinal
1–21	1	9	31	3	4	13
22–91	6	9	8	3	12	4
Total	7	18	39	6	16	17

In the absence of any association each category of patients should, however, behave similarly in their intervals from operation to onset, but it has already been shown that in this respect the bulbar and bulbo-spinal groups were significantly different from the spinal and non-paralytic groups. These differences might be merely reflections of the distinction, such as in age or sex, between the type of patient who is liable to have bulbar involvement and the type who escapes with spinal paralysis or no paralysis. However, the age-distributions of the four categories were very similar, with median ages of 5·4 years for spinal, 6·3 years for non-paralytic, 5·2 years for bulbo-spinal, and 5·6 years for bulbar cases.

In the whole series boys predominated, with 64 out of the total 103. In the bulbar and bulbo-spinal groups they formed 70% of the total, and in the spinal and non-paralytic groups 53%. This difference was not significant ($\chi^2 = 2{\cdot}94$, $·10 > p > {\cdot}05$). Table III shows that within each sex separately the proportion of patients with short intervals of 21 days or less from operation was significantly greater in those with bulbar involvement

TABLE IV—POLIOMYELITIS AND RECENT TONSILLECTOMY: DISTRIBUTION OF INTERVALS FROM TONSILLECTOMY TO ONSET BY TYPE OF ILLNESS AND SEASON

Interval from operation to onset (days)	January–June			July–September			October–December		
	Non-paralytic	Spinal	Bulbar and bulbo-spinal	Non-paralytic	Spinal	Bulbar and bulbo-spinal	Non-paralytic	Spinal	Bulbar and bulbo-spinal
1–21	1	2	8	2	7	26	1	4	10
22–91	3	4	3	5	12	7	1	5	2
Total	4	6	11	7	19	33	2	9	12

than in those of the spinal and non-paralytic groups together (males $\chi^2 = 10{\cdot}32$, $\cdot01 > p > \cdot001$; females $\chi^2 = 7{\cdot}65$, $\cdot01 > p > \cdot001$). Sex differences, therefore, do not account for the distinction between cases with or without bulbar involvement.

A further possibility is that bulbar paralysis is commoner at some stage of an epidemic and that the differences observed are the result of seasonal changes. Table IV shows the intervals from operation of the cases investigated according to the time of onset, January to June, July to September, or October to December. Most of the cases occurred in the principal epidemic period, July to September, but in each of the three periods the same pattern emerged—the cases with bulbar signs showed about twice the proportion of tonsillectomies within the 3 weeks preceding onset as the spinal and non-paralytic groups.

Thus the difference between the bulbar and bulbo-spinal cases on the one hand and spinal and non-paralytic cases on the other cannot be explained in terms of differences in their age, sex, or seasonal distribution, and is probably associated with the operation. There are two possible explanations of this difference. Either the non-paralytic and spinal cases occurred coincidentally and some of those with bulbar manifestations were causally related to the recent operation, or the operation had some causal relationship with the non-paralytic and spinal groups but this association was weaker than with the bulbar and bulbo-spinal groups. The data presented in this paper cannot distinguish between these two possibilities.

In the whole series of 103 cases there were 7 deaths, 4 in children with bulbo-spinal paralysis and 3 in children showing bulbar paralysis only. 5 of these deaths were in patients who developed illness within the 3 weeks following tonsillectomy.

Discussion

No extensive study of the association between poliomyelitis and tonsillectomy has previously been made in England and Wales. The subject has received more attention in the United States of America, where it has caused controversy which still continues. A growing number of observers—for example, Toomey and Krill (1942), J. A. Anderson (1945), Pedersen (1947), Miller (1952), and G. W. Anderson et al. (1950)—agree that more patients with a history of tonsillectomy within a month before the onset of poliomyelitis develop the bulbar form of the disease than can be explained by chance, but they have some doubt about the association between spinal forms of the disease and recent tonsillectomy. Our observations support these conclusions.

To determine accurately the risk of poliomyelitis of the bulbar or bulbo-spinal types being causally related to tonsillectomy we should require to know for different districts and age-groups how many tonsillectomies were performed week by week and the proportion of bulbar and bulbo-spinal cases during the period the investigation was being made. We do not have this information. Over the period of the study, however, 2600 paralytic cases were notified in the 3–9-year age-group. In the same time we observed 42 bulbar and bulbo-spinal cases within 3 weeks after tonsillectomy in this age-group. If all the cases were causally related to the operation (which is unlikely) they would represent less than 2% of the total paralytic cases in the period.

Tonsillectomy as practised at present adds only a few to the total number of cases. As a community problem, therefore, it is small. As a problem for the individual whose tonsils are removed it is important. The practice of stopping tonsillectomy in the late summer and early autumn or when poliomyelitis is epidemic may diminish the number of postoperative cases; but even if tonsils were removed only in the first six months of the year the risk of developing bulbar poliomyelitis soon after the operation would still be present. In addition there might be increased risks of other complications of tonsillectomy, such as intercurrent infection.

Summary

Between March, 1951, and December, 1953, complete reports were received of 103 children up to 18 years of age who developed poliomyelitis within 91 days after tonsillectomy.

61 (59%) had symptoms 1–21 days after tonsillectomy. The concentration was most evident in the bulbar and bulbo-spinal groups where 44 (79%) occurred 1–21 days after operation compared with 38% of the spinal cases and 31% of the non-paralytic cases.

Most cases occurred in the principal epidemic period, but the same pattern was seen in epidemic and non-epidemic seasons.

Tonsillectomy as practised at present added relatively few to the total number of cases of poliomyelitis reported during the study, but tonsillectomy should continue to be restricted in any area where the disease is unusually prevalent.

2. REMOTE TONSILLECTOMY

In the summer of 1951 an investigation was made to determine the importance of the ætiology of poliomyelitis of activating agents such as physical activity, illness, injury, injections, and surgical operations including tonsillectomy and dental operations. For all agents except tonsillectomy the inquiry was restricted to 3 months before the onset of poliomyelitis, but for tonsillectomy a record was made of operations carried out at any time before the onset of symptoms. The investigations were made in Cardiff, the administrative county of Devon, East Anglia, Exeter, Leeds, parts of the administrative county of London, Manchester, and Oxford,† and as only a few cases were obtained in 1951 the inquiry was continued until the end of 1952.

Plan of the Inquiry

The physician of the hospital to which the case was admitted obtained from the patient or his relatives a detailed account of the agents mentioned above and

† The investigations were made by: Dr. I. A. Bolz, Dr. G. Embrys Harries and Dr. J. Greenwood Wilson, Cardiff; Dr. R. P. Boyd, Dr. I. Meredith Davies, Dr. M. Yelland, and others, Devon; Dr. R. A. Leader, Dr. H. Roger, Dr. R. Mayon-White, and Dr. P. J. Wormald, East Anglia; Dr. D. B. Bradshaw, Dr. M. J. Parsonage, and Dr. H. Woodcock, Leeds; Dr. M. I. Adams, Dr. J. V. Armstrong, Dr. H. S. Banks, Dr. H. W. Barnes, Dr. J. Kerr Brown, Dr. F. M. Day, Dr. W. H. Kelleher, Dr. J. C. McDonald, Dr. E. H. R. Smithard, Dr. T. Standring, Dr. A. G. G. Thompson, and Dr. J. H. Weir, London; Dr. B. J. Griffiths and Dr. L. A. Liversedge, Manchester; Dr. A. M-M. Payne and Dr. W. R. Russell, Oxford.

TABLE V—"ACTIVATING AGENTS" INQUIRY, 1951–52: HISTORY OF TONSILLECTOMY IN PATIENTS AND IN THEIR PAIRED CONTROLS

—	Age-group			
	0–4 yr.		5–15 yr.	
	Patients	Controls	Patients	Controls
Tonsillectomy:				
1–21 days before	1	..	..	..
3 wks–1 yr. before	1	..	1	2
1–4 yr. before	..	..	10	5
5 yr. or more before	..	..	10	4
	2	..	21	11
No tonsillectomy	48	51	28	39
History of tonsillectomy unknown	1	..	1	..
Total in group	51	51	50	50

related them carefully to the time of onset of symptoms. At about the same time an epidemiologist obtained similar information from a control child and related the history of the control child to the time of onset of symptoms in the patient. During the course of the illness the physician made careful clinical notes, and when the patient was discharged prepared a comprehensive summary of his findings. If the patient was below school age the control child was selected from the births register of the area. A child of the same sex and of the same age within a limit of two weeks younger or two weeks older who lived nearest the patient was chosen. If the patient was a school-child, a classmate of the same sex and of the same age within the limits mentioned was selected.

Altogether 29 completed records were obtained in 1951 and 111 in 1952—a total of 140. Of these 22 referred to patients in whom the original diagnosis of poliomyelitis was not confirmed, and 17 to patients with non-paralytic illnesses. It was decided that only the records of paralytic cases should be used in the analysis, and the records of these 101 patients and their matched controls constitute the material on which this report is based. Only the information on tonsillectomy, which in most cases included also adenoidectomy, is considered here.

Table v shows the frequency of tonsillectomy in patients and controls by intervals from the operation to the onset of poliomyelitis in the patient. Only 2 of the 51 patients under 5 years of age, and none of the corresponding controls had had their tonsils removed. However, of the 50 patients 5–15 years of age, 21 (42%) had had their tonsils removed, compared with only 11 (22%) of the corresponding controls. The difference between these proportions was statistically significant ($\chi^2=4{\cdot}60$, $\cdot05>p>\cdot02$). None of the operations in patients or controls in the 5–15-year age-group was within three weeks before the development of poliomyelitis and most of the operations had taken place more than one year before the onset.

TABLE VI—SPECIAL INQUIRY, 1953: HISTORY OF TONSILLECTOMY IN PATIENTS 5–15 YEARS AND IN THEIR PAIRED CONTROLS

—	Patients	Controls
Tonsillectomy:		
1–21 days before	1	1
3 wks–1 yr. before	8	5
1–4 yr. before	31	19
5 yr. or more before	11	8
	51	33
No tonsillectomy	101	119
History of tonsillectomy unknown	1	1
Total in group	153	153

Special Inquiry

Though the numbers were small the findings were interesting, and towards the end of 1953 it was decided to carry the investigation further, but to confine it to children of school age (5–15 years). Medical officers of health and the physicians in charge of infectious disease hospitals in the previously mentioned areas and in areas where the incidence had been high during the year ‡ were asked to coöperate in obtaining information about school-children admitted to hospital with paralytic poliomyelitis between Jan. 1 and the end of November, 1953. The medical officers of health obtained the history of tonsillectomy from the patients or their relatives. They also selected paired controls of the same age and sex from the classmates of the patients and recorded their tonsillectomy histories. The physicians completed on a separate form a summary of the illness in the patients, giving the sites and the severity and times of appearance of paralysis. Completed records for 153 patients and controls were received from 26 different areas.

The inquiry was planned so that the information obtained would be similar to that from the earlier "activating agents" investigation for children of the same age, except that it applied to a different group of hospitals and to a different year. In table VI is given the results of the 1953 investigation. Of the 153 patients 51 (33%) had had their tonsils removed, compared with 33 (22%) of the matched controls. As in the earlier inquiry the difference was significant ($\chi^2=5{\cdot}32$, $\cdot05>p>\cdot02$). Most of the excess in patients was in operations performed at least a year before the onset of poliomyelitis.

TABLE VII—BOTH INQUIRIES: HISTORY OF TONSILLECTOMY IN PATIENTS 5–15 YEARS WITH (1) SPINAL, (2) BULBO-SPINAL, AND (3) BULBAR PARALYSIS, AND IN THEIR PAIRED CONTROLS

—	Spinal		Bulbo-spinal		Bulbar		All paralytic	
	Patients	Controls	Patients	Controls	Patients	Controls	Patients	Controls
Tonsillectomy:								
1–21 days before	..	..	..	1	1	..	1	1
3 wks–1 yr. ,,	6	5	1	1	2	1	9	7
1–4 yr. ,,	22	18	6	3	13	3	41	24
5 yr. or more ,,	9	7	7	2	5	3	21	12
	37	30	14	7	21	7	72	44
No tonsillectomy	96	103	17	24	16	31	129	158
History of tonsillectomy unknown	1	1	..	..	1	..	2	1
Total in group	134	134	31	31	38	38	203	203

Both Inquiries

Since both investigations were based on the same plan and the results for children of school age were similar, the two sets of data were combined to form one group relating to 203 patients 5–15 years of age and their corresponding paired controls. In this combined group 72 patients (35%) had had previous tonsillectomy compared with 44 (22%) of the controls. The group was then divided according to the type of paralysis in the patients, into a spinal-paralytic group of 134 patients and controls, a bulbo-spinal group of 31 patients and controls, and a bulbar group of 38 patients and controls. The history of tonsillectomy in each group was then compared (table VII).

‡ Beverley, Bournemouth, Bradford, Bristol, City of Cambridge, County of Cambridge, Carlisle, Coventry, Hull, Islington, Nottingham, Poole, Preston, Sheffield, Southampton, Southend-on-Sea, Southport, Wandsworth, and Weymouth.

TABLE VIII—BOTH INQUIRIES: INTERVAL FROM TONSILLECTOMY TO ONSET IN CHILDREN WITH BULBAR AND BULBO-SPINAL PARALYSIS AND IN THE CONTROLS TO THESE GROUPS WHO HAD UNDERGONE THE OPERATION AT ANY TIME PREVIOUSLY

Interval from tonsillectomy	5–9 yr.		10–15 yr.		5–15 yr.	
	Patients	Controls	Patients	Controls	Patients	Controls
1–21 days ..	1	1	..	..	1	1
3 wks–1 yr. ..	3	2	..	..	3	2
1 yr.	5	3	1	..	6	3
2 yr.	3	2	1	..	4	2
3 yr.	3	..	2	..	5	..
4 yr.	4	..	..	1	4	1
5 yr.	..	1	1	..	1	1
6 yr.	1	..	2	1	3	1
7 yr.	..	..	4	2	4	2
8 yr.	..	1	2	..	2	1
9 yr.	..	..	1	..	1	..
10 yr.	..	..	1	..	1	..
All intervals ..	20	10	15	4	35	14

The spinal-paralytic group show a slightly greater incidence of tonsillectomy in patients than in their controls, 37 patients (28%) against 30 controls (22%) having a history of previous operation. This difference was not significant ($\chi^2=0{\cdot}975$, $\cdot5>p>\cdot3$). The bulbo-spinal group showed a much greater difference, having 14 patients (45%) with a history of tonsillectomy compared with 7 controls (23%); and the bulbar group had 21 patients (55%) with previous tonsillectomy compared with 7 controls (18%). The difference between patients and controls was just below the significance level for the bulbo-spinal group ($\chi^2=3{\cdot}53$, $\cdot10>p>\cdot05$), and was significant for the bulbar group ($\chi^2=11{\cdot}08$, $p<\cdot001$).

From table VII it can be seen that in both bulbar and bulbo-spinal groups the difference between patients and controls lay in operations performed at least a year before the onset of symptoms in the cases. In table VIII the 14 bulbo-spinal and 21 bulbar patients with a history of previous tonsillectomy and the 7 controls from each group who had also had the operation are shown. The intervals from operations to onset are given for patients and controls aged 5–9 years and for those aged 10–15 years. In the younger group most of the operations took place 1–4 years before the onset of symptoms, while in the older group most of the operations had taken place at least 5 years before the development of poliomyelitis.

Discussion

In this study the bulbo-spinal group of cases occupied an intermediate position between the spinal-paralytic group of cases and the bulbar group but is nearer to the bulbar group, and it is not possible to reveal significant differences between these two so far as the history of tonsillectomy is concerned. It is possible that in a larger series the intermediate position of the bulbo-spinal group would be shown to be a true one.

Within the limited age range of this study therefore it appears that the removal of tonsils even 5 or more years before the onset of symptoms made patients with poliomyelitis more liable to develop the bulbar or bulbo-spinal form than the spinal-paralytic form.

Fischer et al. (1941), Top and Vaughan (1941), and Lucchesi and La Boccetta (1944) made a similar suggestion, and since this investigation was begun in 1951 four relevant papers have been published. Top (1952) reviewed the case-histories of 1947 patients with poliomyelitis admitted to the Herman Kiefer Hospital between 1940 and 1949 and found that 52% had a history of tonsillectomy. When the cases were divided into clinical types, he found that 85% of the bulbar cases and 69% of the bulbo-spinal cases had had their tonsils removed, compared with 43% of the spinal paralytic cases and 46% of the non-paralytic cases. Southcott (1953) made an inquiry in South Australia and found that 35 of 39 bulbar cases had a history of tonsillectomy compared with 21 of 61 spinal-paralytic cases. Weinstein et al. (1954) studied the records of 800 cases most of which had been in patients in the care of one of the authors and obtained somewhat similar results, though information on the interval from tonsillectomy to the onset of poliomyelitis was not given. Anderson and Rondeau (1954) analysed the tonsillectomy history as obtained from the near relatives of over 2000 cases in the 1946 outbreak in Minnesota. 71% of the bulbar cases had undergone tonsillectomy compared with 28–35% of the spinal-paralytic and the non-paralytic cases. The authors noted that the differences were similar at all ages and that they were not associated with the sex or economic status of the patients. They gave evidence suggesting that the differences were associated with the removal of the tonsils and not with susceptibility to tonsillitis.

The findings reported here are in substantial agreement with those of the North American and Australian observers, and indicate that persons whose tonsils have been removed are more likely than persons whose tonsils have not been removed to develop the bulbar or bulbo-spinal form of the disease, even if the interval from operation to the onset of the disease is long. Further, since there was no corresponding deficiency in spinal cases with a history of tonsillectomy compared with their controls, it must be concluded that there has not merely been a transfer from one type of paralysis to another. It is possible that the apparent association between remote tonsillectomy and bulbar poliomyelitis is indirect—that the type of child who is liable to have his tonsils removed is also the type most likely to develop bulbar paralysis. For example, tonsillectomy is commoner in the children of well-to-do parents, and if bulbar involvement also showed the same social trend this might explain the apparent association. Alternatively, if bulbar paralysis was commoner in older children, who have had greater opportunity for operation, the association might also be explained. But such hypotheses fail because patients and controls were matched for age and sex, and the method of pairing through classmates ought to have ensured that there were no large or consistent social-class differences.

An indirect explanation for the association between tonsillectomy and the subsequent development after a long interval of bulbar or bulbo-spinal poliomyelitis might have been thought more likely to lie in some local condition of the pharynx which on the one hand is an indication for tonsillectomy and on the other hand makes the child more liable to bulbar poliomyelitis even after the operation; but Anderson and Rondeau's inquiry into tonsillitis, discussed earlier, renders this explanation less acceptable. On present information, therefore, it must be concluded that the removal of tonsils was responsible for some children developing bulbar or bulbo-spinal poliomyelitis who would not otherwise have had it.

Summary

Between mid-1951 and November, 1953, records were obtained in selected areas of England and Wales of the history of tonsillectomy at any time before the onset of paralytic poliomyelitis in 51 patients under 5 years of age and 203 patients 5–15 years of age. Histories were similarly obtained for the same number of matched controls. Only 2 of the patients and none of the controls under 5 years of age had had their tonsils removed.

In the 5–15-year age-group, 72 (35%) of the patients had undergone tonsillectomy compared with 44 (22%) of the controls. The differences between patients and controls were greatest in the group with bulbar paralysis, intermediate in the group with bulbo-spinal paralysis, and least in the group with spinal paralysis.

In the bulbar and bulbo-spinal groups, most patients had had their tonsils removed at least 1 year and often 5 or more years before the onset of poliomyelitis.

The results indicated that persons whose tonsils had been removed were more likely to develop the bulbar form of poliomyelitis than those who had not had the operation, even if years had elapsed between the removal of the tonsils and the onset of poliomyelitis.

REFERENCES

Anderson, G.W., Anderson, G., Skaar, A. E., Sandler, F. (1950) *Ann. Otol., &c., St. Louis*, **59**, 602.
— Rondeau, J. L. (1954) *J. Amer. med. Ass.* **155**, 1123.
Anderson, J. A. (1945) *J. Pediat.* **27**, 68.
Fischer, A. E., Stillerman, M., Marks, H. H. (1941) *Amer. J. Dis. Child.* **61**, 305.
Lucchesi, P. F., La Boccetta, A. C. (1944) *Ibid*, **68**, 1.
Miller, A. H. (1952) *J. Amer. med. Ass.* **150**, 532.
Pedersen, P. M. (1947) *Ann. Otol., &c., St. Louis*, **56**, 281.
Southcott, R. V. (1953) *Med. J. Aust.* ii, 281.
Toomey, J. A., Krill, C. E. (1942) *Ohio St. med. J.* **38**, 653.
Top, F. H. (1952) *J. Amer. med. Ass.* **150**, 534.
— Vaughan, H. F. (1941) *Amer. J. publ. Hlth*, **31**, 777.
Weinstein, L., Vogel, M. L., Weinstein, N. (1954) *J. Pediat.* **44**, 14.

CONGENITAL DERMAL SINUSES IN CHILDREN

THEIR RELATION TO PILONIDAL SINUSES

J. C. HAWORTH
M.B. Birm., M.R.C.P., D.C.H.
SENIOR MEDICAL REGISTRAR

R. B. ZACHARY
M.B. Leeds, F.R.C.S.
CONSULTANT PÆDIATRIC SURGEON

CHILDREN'S HOSPITAL, SHEFFIELD, YORKS

A CONGENITAL dermal sinus is a developmental anomaly consisting of a sinus lined by epithelium, and it may lead from the skin over the skull or the spine to the deeper tissues. It can be attached to some part of the central nervous system or its coverings, and sometimes ends in a dermoid cyst or, rarely, a teratoma within the skull or the spinal canal. A few hairs may protrude from the sinus, and occasionally it may be surrounded by a hæmangioma.

Frequently the nature of the lesion is overlooked until the patient develops signs of complications, which are of two types:

(1) Infection, which may be local or may spread from the skin along the track of the sinus to involve the central nervous system, causing meningitis or an extradural or subdural abscess. Sometimes a patient may have several attacks of meningitis before the cause is recognised.

(2) A dermoid cyst at the end of the track may enlarge and cause pressure effects in the skull or on the spinal cord or the cauda equina.

Clark (1918) was probably the first to describe a congenital dermal sinus connected with the central nervous system, and Cardell and Laurance (1951) reviewed 34 previously published cases and added 1 of their own. Since then other cases have been published by Matson and Ingraham (1951), Logue and Till (1952), Schwartz (1952), and Perloff (1954).

We have recently seen 3 children in whom a congenital dermal sinus over the spine communicated with the central nervous system. We have also seen 15 other children with sinuses overlying the coccyx; and, although most of these were shown not to communicate with the spinal cord or the meninges, 2 became infected, 1 killing the child.

Case-reports

Case 1.—A male baby, otherwise healthy, developed a purulent discharge from a small sinus over the sacrum at the age of 11 months. The father had had an operation for pilonidal sinus five years previously. At the age of 1 year the baby developed signs of meningitis and was admitted to an isolation hospital. Lumbar puncture produced purulent cerebrospinal fluid (C.S.F.), and proteus was grown on culture. A swab from the sacral sinus grew micrococci and non-hæmolytic streptococci. The baby was treated with penicillin, and later streptomycin and chloramphenicol were substituted because the organism was sensitive to both these antibiotics. He made a complete recovery and was discharged home after about a month. A few days later the sinus was again discharging, and he was admitted to the Sheffield Children's Hospital.

On examination he was well-nourished but hypotonic, with no abnormality in the central nervous system. He could sit unaided and stand with support momentarily. A small sinus was present over the sacrum and just to the left of the midline, and creamy material could be expressed from it. The surrounding skin was red and hard, and just below the sinus was a raised granulomatous area. Radiography of the spine showed no abnormality. A swab from the sinus grew proteus.

Operation.—The sinus was found to lead down to the sacral hiatus as a well-defined tube 2 mm. in diameter; this was excised. Laminectomy done from there up to the 4th lumbar vertebra showed that the track led into the dura and finished as a continuation of the filum terminale. The cauda equina was adherent to the sinus, and with difficulty some of the nerves were dissected free. The track was tied off and the lesion removed.

Postoperatively the baby's condition was good and the wound healed soundly. There was thought to be some weakness of the legs when he was discharged home ten days after operation, but six months later there was no sign of any weakness and he had control over his bowel and bladder sphincters.

Pathology.—An elliptical area of skin 2·5 × 1·5 cm. with a sinus track 7 cm. long, whose distal end had been detached from the cauda equina. The lumen was patent to within 0·2 cm. of the distal end of the sinus. The proximal 1·5 cm. of the sinus was narrow but then broadened out into a track 0·7 cm. in circumference and contained hair and sebaceous material.

Summary.—A congenital dermal sinus over the sacrum and continuous with the filum terminale. An ascending infection caused meningitis.

Case 2 (Lorber 1955).—A baby boy developed meningitis due to *Escherichia coli* at the age of 3 months. He was treated in another hospital with penicillin and sulphonamides and recovered. A few days later he relapsed, was again treated, and made a slow recovery. He then remained well until the age of 13 months, when he had a third attack of meningitis due to *Esch. coli*. He was treated in the same hospital with various combinations of antibiotics, but response was poor and he was transferred to the Sheffield Children's Hospital.

On examination he had signs of meningitis and a cauda-equina compression syndrome with flaccid paralysis of the legs, loss of sensation, and retention of urine with overflow. Over the 4th lumbar spine in the midline was a small sinus from which a tuft of hair protruded and which was surrounded by a capillary hæmangioma. It was considered that the recurrent attacks of meningitis were caused by infection spreading upwards from a congenital dermal sinus, and that the cauda equina was compressed by an intraspinal dermoid associated with the sinus. The meningitis was eventually controlled with streptomycin, polymyxin, and sulphadiazine.

Operation.—Mr. J. Hardman excised the sinus and dermoid. The sinus led into the subarachnoid space and ended in an infected currant-sized dermoid compressing the dorsal aspect of the lumbar cord.

Postoperatively the operation wound healed slowly, and a few days later the baby again developed meningitis, caused this time by *Staphylococcus aureus*. The infection responded to aureomycin.

Follow-up.—The child is now generally well at the age of $3^1/_2$ years, but the signs of the cauda-equina lesion persist with weakness and anæsthesia of the legs and incontinence of urine and fæces. He has fits which are not controlled with anticonvulsants.

Summary.—Recurrent *Esch. coli* meningitis caused by ascending infection from a congenital dermal sinus. This sinus ended in a dermoid within the spinal canal and compressed the lumbar cord. After excision of the sinus a cauda-equina lesion persisted.

Case 3.—A male baby was first seen in the outpatient clinic at the age of 4 months. Over the lower lumbar spine was a reddish zone of skin about 4 cm. in diameter, slightly raised above the adjacent skin and softer than surrounding tissues (fig. 1). The spinous processes were impalpable at this site, but there was a lateral bony ridge. In the centre was a sinus, whose base could not be exposed. There was no neurological defect, and the baby was otherwise quite well.

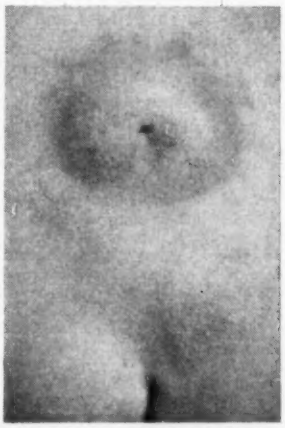


Fig. 1—Case 3: raised area with sinus over lower lumbar spine.

Operation.—He was admitted at the age of 11 months, and the track was excised. It was found to lead down through a spina bifida and upwards deep to the upper lumbar spine, where it entered the dura and was attached to the lower end of the spinal cord, at which point it was excised (fig. 2).

His elder brother had a meningomyelocele removed on the same day at the age of 2 years 1 month.

Summary.—A congenital dermal sinus overlying the lower lumbar spine and leading through a spina bifida to be attached to the cord. No complications.

Case 4.—A boy, aged 1 year 9 months, was admitted to hospital with impetigo, and during routine examination was found to have a congenital dermal sinus situated in the midline over the coccyx. There was no sign of inflammation, and the sinus had never discharged. The mother stated that she had a similar sinus, and so had one of her brothers. Neither of them had suffered any disability from it.

Operation.—The child was admitted to hospital a month later, and at operation the sinus was followed downwards and found to be attached to the coccyx, which was excised with the sinus track. The wound healed and the child made an uninterrupted recovery.

Summary.—An uncomplicated congenital dermal sinus overlying and attached to the coccyx.

Case 5.—A baby girl, aged 7 months, attended the casualty department on account of an injury to the left arm, and at the same time the mother reported a "hole in the back" which had first been noticed at the age of 6 weeks and from which pus discharged at times.

On examination there was a deep sinus at the upper end of the natal cleft, but there was no discharge from it then.

Operation.—In view of the recurrent infection a wide wedge of tissue down to the sacrum was excised. No communication with the spinal cord or meninges was found. Infection persisted, and a further wide excision had to be done. Final healing did not take place until three months later.

Summary.—A congenital dermal sinus, similar to that of case 4, became secondarily infected and gave rise to a "pilonidal sinus."

Case 6.—A male baby had been quite healthy until the age of 7 weeks, and the parents had noted no abnormality apart from slight mucoid rhinorrhœa. He then suddenly became ill with pallor, increasing feebleness, and rapid breathing. He was admitted to Sheffield Children's Hospital on the third day of his illness.

On examination he was moribund, pale, and had a poor cry and an almost imperceptible pulse. His limbs were hypotonic and he had no meningism. Three sinuses were seen over the lower part of the back (fig. 3). One was in the midline over the tip of the coccyx about 1 cm. above the anus and was discharging thin pus. The other two were over the left buttock; the upper sinus appeared "blind," the lower one was patent but not discharging, and there were no signs of surrounding inflammation. Congenital dermal sinuses with probable secondary meningitis were diagnosed. Lumbar puncture produced no C.S.F., but 2 ml. of thick pus was aspirated, and penicillin 10,000 units was injected through the lumbar-puncture needle. Shortly afterwards the baby died before further treatment could be instituted. A throat swab and culture of the fluid obtained at lumbar puncture later grew coagulase-positive *Staph. aureus.*

Fig. 3—Case 6: three sinuses over lower part of back.

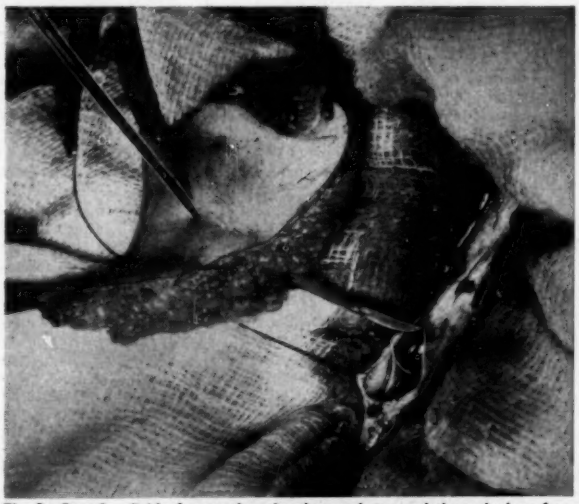


Fig. 2—Case 3: field of operation showing probe passed through sinus from orifice to spinal cord via spina bifida.

Necropsy Findings.—The midline sinus opening above the anus pursued a straight course to the coccyx, but a probe could not be passed into the spinal theca. The lower sinus in the left buttock extended upwards medially for 2 cm. and was attached by a fibrous cord to the vertebral column adjacent to the lumbosacral articulation. There was a purulent exudate lying extradurally in the posterior part of the spinal canal and extending upwards to the attachment of the dura at the foramen magnum. The dura was œdematous and congested throughout, and the spinal cord was compressed anteroposteriorly. The exudate within the lower part of the spinal canal had apparently been aspirated during life, and there was a space between the laminæ and the dura, which was displaced forwards. There was no exudate within the subarachnoid space, and the brain was normal apart from congestion. Sections taken from the midline sinus showed numerous hair follicles and sebaceous glands (fig. 4).

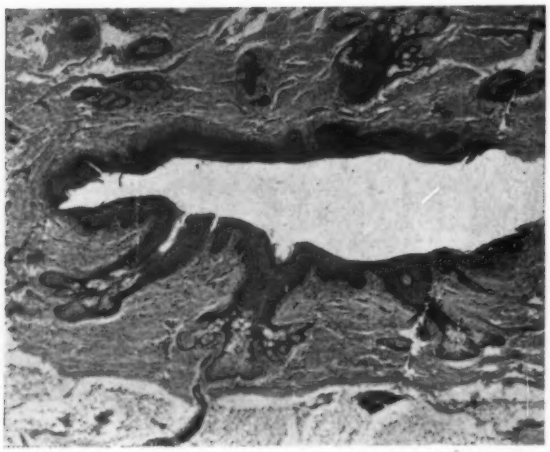


Fig. 4—Case 6: transverse section of sinus, showing hair follicles and sebaceous glands. (×35.)

Summary.—A congenital dermal sinus overlying the coccyx and similar to that of case 4. Although the sinus did not communicate with the meninges, infection starting in the wall of the sinus tracked upwards into the extradural tissues and caused a fatal extradural abscess (fig. 5).

5 children (cases 7–11 in table) were seen with uncomplicated sinuses similar to that of case 4. Case 7 had a V fold of skin overlying the coccyx, with pits at the upper ends of the V. One of these pits was "blind," but the other appeared to be a sinus. Case 9 had an associated meningomyelocele (fig. 6). Case 11 had two sinuses on either side of the midline over the sacrum. This child's mother said that she had a similar condition and so had the mother's sister and the sister's child. None of these sinuses had ever become infected.

In an attempt to determine the frequency of congenital dermal sinuses we examined 500 children attending this hospital as either inpatients or outpatients in three months. Of these 500 children 7 (1·4%) had a sinus overlying the coccyx (cases 12–18 in table), and 14 others (2·8%) had deep dimples in the same region. Six of the sinuses of cases 7–18 were dissected out either at operation or at necropsy. In each case the condition was the same—a tube of epithelium of varying depth connected to the tip of the coccyx by a fibrous band.

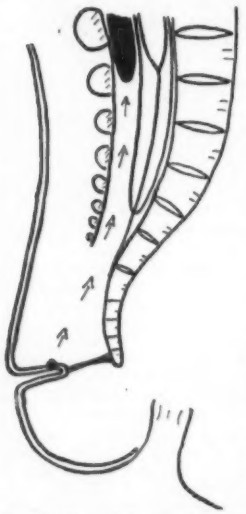


Fig. 5—How infection in wall of congenital dermal sinus tracked up in tissues to form extradural abscess compressing spinal cord in case 6.

Discussion

We have found congenital dermal sinuses overlying the coccyx in 1·4% of the 500 children we examined, and deep dimples were present in the same region in a further 2·8%. Many others had a shallower depression which was merely an exaggeration of the normal slight depression found in the skin of this part of the body. This probably accounts for Lanelonge's (cited by Mallory 1892) and Sharpe's (1937) statements that a cicatricial depression could be found over the coccyx in 1 out of 4 or 5 children.

There has been much discussion about the relationship of these sacrococcygeal dimples or sinuses to pilonidal sinuses, which are such a troublesome complaint in young adults.

The earliest descriptions of pilonidal sinus were those of Anderson (1847) and Warren (1854), but the name "pilonidal sinus" (meaning a nest of hair) was first given to the condition by Hodges (1880). He thought that the basis of the condition was a congenital coccygeal dimple in which detached body-hair and other debris lodged. Owing to trauma and lack of hygiene the hair penetrated into the subcutaneous tissues and there provoked inflammation and suppuration, the original dimple in the skin eventually becoming the fistulous opening of a large abscess. The coccygeal dimple was, he thought, caused by imperfect fusion of the two halves of the body.

Mallory (1892) described the examination of the sacrococcygeal region of fœtuses and came to the conclusion that sinuses, dimples, and cysts in this region were the result of an incomplete obliteration of the medullary canal during the formation of the neural tube.

Bland-Sutton (1917) considered that sinuses over the lower spine were sequestration dermoids, and Gabriel (1949) attributes pilonidal sinuses to the same cause.

Stone (1931) proposed the novel theory that pilonidal sinuses were downgrowths of the skin, analogous to the preen glands of birds.

Fig. 6—Case 9: sinus and meningomyelocele.

Walker and Bucy (1934), who reviewed 4 previously published cases of congenital dermal sinus and added 3 of their own, stated that they were identical with pilonidal sinuses. They pointed out that Mallory's theory would not explain the presence of these anomalies in regions of the body other than the sacrococcygeal, and suggested that they were caused by failure of separation of the cutaneous epithelial ectoderm from the neuro-epithelial ectoderm during embryological development, with the result that a narrow invagination of skin was carried down by the neural tube.

Fox (1935) considered that pilonidal sinuses were due to persistence of ectoderm invaginations normally present in the sacrococcygeal region of embryos.

Gage (1935) thought that pilonidal sinuses were a developmental defect in the caudal end of the neural tube (Mallory's theory) but considered that sacral dimples had a different ætiology and were due to anomalous development of the caudal ligament attaching the skin to the coccyx, as originally suggested by Oehlecker (1926).

Patey and Scarff (1946, 1948) cast doubt on the developmental origin of pilonidal sinuses. They compared the well-known condition in the sacrococcygeal region to similar lesions in the webs of barbers' fingers, and thought that both were the reaction of the tissues to the penetration of the skin by hairs from outside, and that, if a congenital dimple or sinus played any part, it merely acted as a site of entry for the hair. Since then accounts have appeared of pilonidal sinuses in other situations: Aird (1952) treated one in the axilla, and Smith (1948) described 4 cases of sinus in the perineum. Hueston (1953) supports the theory that they are acquired, and so does the *British Medical Journal* (1954).

SUMMARY OF 11 CASES WITH COCCYGEAL SINUS

Case no.	Sex	Age	Radiograph of spine	Operation or necropsy	Other conditions
7	M	1 yr.	..	Necr.	Cardiac fibro-elastosis
8	M	11 mos.	..	Op.	..
9	F	3 wk.	..	..	Lumbar meningo-myelocele
10	F	2 yr.	Normal	..	Congenital absence of tongue
11	F	7 yr.	Spina bifida occulta S1	..	..
12	M	4½ yr.	Normal	..	..
13	F	6 yr.	..	Necr.	Lipomelanic reticulosis
14	M	1½ yr.	Normal	..	Congenital heart-disease
15	F	5½ yr.	..	Op.	..
16	F	3 yr.	Spina bifida occulta L5	Op.	..
17	M	6 mos.	..	Op.	..
18	F	3½ yr.	Normal	..	Double ureter

The main arguments of these workers for regarding sacrococcygeal pilonidal sinuses as acquired are the age and sex distribution, and the fact that most of the patients are young adult hirsute males; this they correlate with the finding of short coarse stiff hairs within the lesion, suggesting that detached body-hairs have pierced the skin or have been sucked in from outside (Patey and Scarff 1948). They also state that hair follicles and sebaceous glands are seldom found in the lesions, and that congenital anomalies in the sacrococcygeal region are rare.

Some of these statements are not in accordance with the facts:

(1) We have already stated that coccygeal sinuses and dimples are not uncommon.

(2) The male preponderance of pilonidal sinus is by no means so great in some series; for instance, in Gabriel's (1949) series of 107 cases 38 were in women, many aged less than 25, when hair on the buttocks is very unusual, and in Whyte's (1938) smaller series of 45 cases 32 were in women.

(3) About 50% of pilonidal sinuses contain no hair at all (Turell and Gladstone 1951), and sometimes at operation a long coiled lock of hair is removed which could not possibly have entered from without (Gabriel 1949).

Thus the theory that the condition is acquired does not explain pilonidal sinuses in people who are not hirsute, why in half the cases no hair is found in the sinus, and why the lesion is so constantly located in the midline of the sacrococcygeal region.

We believe that pilonidal sinuses are merely infected congenital dermal sinuses, and we consider the sequence of events in the formation of pilonidal sinuses to be as follows. A congenital dermal sinus is present at birth and because it causes no symptoms it is not noticed. If it overlies the coccyx it will probably not communicate with the meninges or the spinal cord. From the age of puberty the lesion is always a potential menace, the hair of the epithelium-lined track grows, as does the other body-hair, the sebaceous glands secrete, the buttocks enlarge, hygiene is perhaps not so good as it should be, and from a combination of these factors the orifice of the sinus becomes obstructed and infection takes place and spreads into the subcutaneous tissues, forming abscesses and secondary sinuses. Trauma may also be a contributory factor—e.g., "jeep seat" of soldiers in the 1939–45 war.

The original structure of the sinus is destroyed by abscess and granulation tissue; and, when the lesion is excised at operation, sebaceous glands and hair follicles are seldom found. Case 5 had an early "pilonidal sinus" which was clearly an infected dermal sinus and bears out the above explanation. If pilonidal sinus is commoner in males, this could be explained by the fact that hairs, which are more profuse in the male, are thus more likely to grow and obstruct the lumen of the sinus, and personal hygiene in males is often less good than in women. Weale (1955), who cut serial sections of pilonidal sinuses in adults, showed that the contained hair originated in their depth, and he concluded that the sinuses were therefore developmental defects. Hodges (1880) recognised the importance of the congenital coccygeal sinuses and dimples although he thought that the hair penetrated into the sinus from without rather than grew in situ.

We consider that pilonidal sinuses in barbers' hands, in the axillæ, and in other sites are entirely different conditions since they are obviously acquired lesions. "Congenital dermal sinus" is a better term than "pilonidal sinus" for the lesion in the sacrococcygeal region, whereas "foreign body" or "hair granuloma" could be used for the lesions which are obviously acquired.

Congenital dermal sinuses are sometimes familial and hereditary. The mother and uncle of case 4 also had a congenital dermal sinus; the mother, aunt, and cousin of case 11 had a similar condition; and the father of case 1 had been treated for a pilonidal sinus. 3 cases have been published of pilonidal sinuses in identical twins (Mechling 1934, Goldberg and Bloomenthal 1939, Fox 1944).

Case 6 had two unusual aspects:

(1) Although the sinus overlying the coccyx was similar to those of cases 4, 5, and 7–18 and could not be shown to communicate directly with the meninges, nevertheless it illustrated that a coccygeal sinus may give rise to more than a local infection. Infection starting in the wall of the sinus had presumably spread upwards in the tissues to the extradural space as indicated in fig. 5. Stammers (1938) published a very similar case.

(2) There were two other sinuses in the left buttock, the lower of which was found to be attached to the vertebral column adjacent to the lumbosacral articulation by a fibrous cord.

We disagree with Gage (1935) that pilonidal sinuses and sacrococcygeal dimples have different causes. A deep dimple is almost impossible to differentiate from a sinus by inspection alone, and dimples and sinuses must surely be merely degrees of the same condition. We have no new theory to offer for the causation of congenital dermal sinuses but we agree with Walker and Bucy (1934) that a narrow invagination of skin is carried down by the neural tube as it separates from the cutaneous ectoderm. Since spina bifida is also caused by faulty closure and descent of the neural tube, it is not surprising that the two conditions are sometimes found together. It is noteworthy in this respect that cases 3, 11, and 16 were associated with a spina bifida, and case 9 also had a meningomyelocele.

Treatment

If a sinus is found in any position over the spine and its base cannot be exposed by pressure on the adjacent skin, it should be removed with its track for two reasons:

(1) Excision will prevent the formation of an infected "pilonidal sinus," which may be so troublesome to the patient in later life.

(2) It will prevent complications in the central nervous system. On external examination it is impossible to distinguish those sinuses that communicate with the central nervous system from those that do not; consequently either infection or pressure effects due to an expanding dermoid cyst may occur. The sinuses over the coccyx are unlikely to communicate

in this way, but infection may still track to the extradural space.

It is probably unwise to probe or inject the sinus with radio-opaque material, because of the danger of introducing infection, and often the sinus track is too small to admit a probe or needle.

Summary

18 cases are reported of children who had congenital dermal sinuses overlying the spine.

In 3 cases the sinus communicated with the central nervous system; 2 of these children developed meningitis due to infection spreading along the sinus track.

15 children had sinuses in the coccygeal area; and, although these sinuses did not communicate with the central nervous system, 1 became locally infected, and in 1 other case infection spread to the extradural space.

Congenital dermal sinuses overlying the coccyx were found in 7 (1·4%) of 500 children examined.

"Pilonidal sinus" in the sacrococcygeal area is due to local infection in a congenital dermal sinus in adult life, when the orifice of the sinus is likely to become obstructed.

Hairs in "pilonidal sinuses" have grown in situ.

"Pilonidal sinuses" in other situations are obviously acquired and quite different conditions.

Congenital dermal sinuses which are not just superficial dimples should be excised to prevent infection, either local or spreading into the central nervous system.

We thank Dr. T. Colver, Dr. Doris Fletcher, Prof. R. S. Illingworth, and Mr. A. Young for permission to examine and report cases under their care; and Dr. J. L. Emery and Dr. N. M. Gibbs for the pathological details.

REFERENCES

Aird, I. (1952) *Brit. med. J.* i, 902.
Anderson, A. W. (1847) *Boston med. surg. J.* **36**, 74.
Bland-Sutton, J. (1917) Tumours, Innocent and Malignant. 6th ed., London.
British Medical Journal (1954) ii, 694.
Cardell, B. S., Laurance, B. (1951) *Brit. med. J.* ii, 1558.
Clark, S. N. (1918) *J. nerv. ment. Dis.* **48**, 201.
Fox, P. F. (1944) *J. Amer. med. Ass.* **125**, 120.
Fox, S. L. (1935) *Surg. Gynec. Obstet.* **60**, 137.
Gabriel, W. B. (1949) The Principles and Practice of Rectal Surgery. 4th ed., London.
Gage, M. (1935) *Arch. Surg.* **31**, 175.
Goldberg, S. L., Bloomenthal, E. D. (1939) *J. Amer. med. Ass.* **113**, 1401.
Hodges, R. M. (1880) *Boston med. surg. J.* **103**, 485.
Hueston, J. T. (1953) *Brit. J. Surg.* **41**, 307.
Logue, V., Till, K. (1952) *J. Neurol. Psychiat.* **15**, 1.
Lorber, J. (1955) *Proc. R. Soc. Med.* **48**, 332.
Mallory, F. B. (1892) *Amer. J. med. Sci.* **103**, 263.
Matson, D. D., Ingraham, F. D. (1951) *Pediatrics*, **8**, 463.
Mechling, C. C. (1934) *J. Amer. med. Ass.* **102**, 367.
Oehlecker, F. (1926) *Disch. Z. Chir.* **197**, 262.
Patey, D. H., Scarff, R. W. (1946) *Lancet*, ii, 484.
— — (1948) *Ibid*, ii, 13.
Perloff, M. M. (1954) *J. Pediat.* **44**, 73.
Schwartz, H. G. (1952) *Ann. Surg.* **136**, 183.
Sharpe, A. M. (1937) *Amer. J. Roentgenol.* **38**, 303.
Smith, T. E. (1948) *J. Amer. med. Ass.* **136**, 973.
Stammers, F. A. R. (1938) *Brit. J. Surg.* **26**, 366.
Stone, H. B. (1931) *Ann. Surg.* **94**, 317.
Turell, R., Gladstone, A. A. (1951) *Int. Abstr. Surg.* **93**, 417.
Walker, A. E., Bucy, P. C. (1934) *Brain*, **57**, 401.
Warren, J. M. (1854) *Amer. J. med. Sci.* **28**, 113.
Weale, F. E. (1955) *Lancet*, i, 230.
Whyte, A. H. (1938) *Proc. R. Soc. Med.* **31**, 982.

"... In the National Health Service approximately six prescriptions are dispensed for each man, woman, and child in this country each year. An examination of these prescriptions discloses that two out of every six are for sedatives to 'calm the nerves'... Few will disagree with the contention that the family doctor would discharge his duties in this direction much more effectively if his training as a doctor were not still confined almost exclusively to the understanding and treatment of physical abnormalities and if he had time to listen to his patients or made time to do so."—Dr. COLMAN KENTON, regional psychiatrist to the North West Metropolitan Regional Hospital Board, at the annual conference of the Association of Hospital Management Committees at Hastings, *Scotsman*, June 18, p. 6.

THE ANTIBIOTIC RESIDUES IN AMŒBIASIS

T. G. ARMSTRONG
M.A., M.D. Camb., M.R.C.P.
HONORARY CONSULTANT

A. J. WILMOT
D.M. Oxfd, M.R.C.P.
ASSISTANT DIRECTOR

R. ELSDON-DEW
M.D. Witwatersrand, F.R.S. (S.Af)
DIRECTOR

AMŒBIASIS RESEARCH UNIT *

FOR about eight years this unit has been actively engaged in a long series of therapeutic trials for the treatment of amœbiasis.

We have been unusually fortunate in being able to select a relatively standard grade of ulcerative amœbiasis from the numerous cases presenting. This has enabled us to compare statistically the results of treatment with many single substances, and we have now tested and reported on a large number of chemotherapeutic agents at present in common use. We (Elsdon-Dew et al. 1952) have been particularly interested in the rôles played by the antibiotics and have reported on the very beneficial effects of oxytetracycline, chlortetracycline (aureomycin), and a combination of penicillin and succinylsulphathiazole, as well as on the less useful results achieved with chloramphenicol, neomycin, and bacitracin. We found that, in doses of 1 g. for 15 days, chlortetracycline used alone apparently immediately cured 47 of 50 patients. None the less at least 14% of all patients treated with chlortetracycline relapsed soon after treatment was completed. Our long and varied experience with the chemotherapy of amœbiasis had shown us that the tetracycline compounds were the most powerful single therapeutic agents at our disposal. We believed on theoretical grounds that, though chlortetracycline had been shown to have an amœbicidal action in vitro, its main action (and that of the many other partially effective antibiotics) was by a modification of the bacterial flora in the bowel with a resultant change of the environment of the amœba. We were therefore greatly interested to read that Barnard (1951) had been treating with temporary success some cases of acute leukæmia with the fermentation residues of the antibiotics and claimed that his results were due to a modification of the bacterial flora in the bowel. Since we were looking for an inexpensive substitute for chlortetracycline for treating the almost epidemic form of amœbiasis found in Durban, it seemed well worth while to set up a therapeutic trial of the fermentation residues of some of the antibiotics. The cost of these could be measured in pence instead of pounds. The results of these trials and the development from them of a simple and inexpensive ambulant treatment for amœbiasis forms the subject of this paper.

Material and Method

All our patients were adult male Africans with the acute dysenteric form of amœbiasis. All the patients accepted for a series conformed to the following strict standards: all had visible ulcers in the colon, and in all of them motile trophozoites were found in stools or scrapings. The symptomless or mildly symptomatic cyst-passer was not accepted. Seriously ill patients with sloughing ulcers, abdominal distension, or chloride depletion were not accepted for the experimental series. Apart from this no selection was used, and the results reported here are quite comparable with those we have previously published.

Sigmoidoscopy was done before treatment and on each successive day thereafter until the ulcers were healed, and in any case on the 10th, 15th, 20th, and 27th days

* The Amœbiasis Research Unit is under the sponsorship of the South African Council for Scientific and Industrial Research, the Natal Provincial Administration, and the University of Natal.

after the start of treatment. Stools were examined every day when possible.

At sigmoidoscopy we assessed the status of the patient on the following criteria:

(1) *Success:* symptom-free; no amœbæ in stool or scraping; all ulcers healed.
(2) *Probable failure:* ulcers still present; no amœbæ.
(3) *Absolute failure:* ulcers and amœbæ present.
(4) *Symptomless cyst-passer:* cysts in stools; no ulcers.
(5) *Removed from treatment:* previous absolute failures who were given other treatment known to be effective in the interest of safety.

Patients removed from the series for other treatment were assessed on all subsequent days as "absolute failures" and are included as such in the figures for each date. The figures for "total parasitic failure" are therefore the sum of the absolute failures, the symptomless cyst-passers, and those absolute failures previously removed from treatment.

It will be noticed that the figures from treatment with emetine are given only for the 20th day. This drug and some others were used early in our trials when we made our final assessment on the 20th day of treatment. For this reason, and to conform with the standards in previous papers, our final comparison of the efficacy of any drug used was made on the 20th-day figures. Those for emetine are included here as a comparative reference.

The 20th-day figures may be taken as giving a reasonable indication of "immediate apparent cure" but tell us nothing of the relapse-rate. The figures for 27 days give a slight indication of relapse-rate; for, if successes decrease and failures increase materially above the 20th-day figures, it is likely that relapse will be more frequent. It is for this reason that we include the figures for 15 and 27 days, so that this trend can be appreciated. Though we paid our patients a small sum to return for a monthly follow-up for 6 months for stool testing and sigmoidoscopy, very few did so, and we have only the scantiest information on relapse. Though we sometimes had evidence of a high relapse-rate in the number of patients who soon fell sick again and returned to us, we were never able to obtain any valid statistical evidence of those who remained well and had no reason to return.

For this reason our figures can only provide information on immediate apparent cure and give little information about relapses.

Results

Chlortetracycline Residue

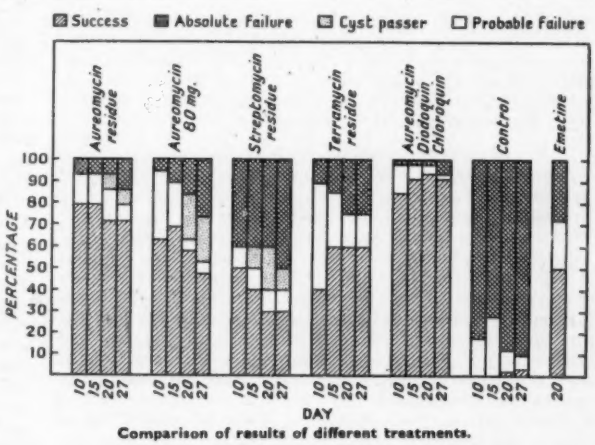
Fourteen patients were given the residue from the manufacture of aureomycin 4 g. daily for 10 days. Apart from unknown constituents this was known to contain 80 mg. of chlortetracycline and 24·4 μg. of cyanocobalamin. It contained no actidione. It was dispensed in capsules and produced no side-effects of any kind.

As will be seen from the accompanying figure, there were a high success-rate (79·5%) and a low absolute failure-rate (7·1%) at 10 and 15 days. At 20 days successes were still 71·4%, but 7% of patients were passing cysts. At 27 days absolute failures increased to 14% and the total parasitic failure was 21%. Follow-up a month later produced three successes and two absolute failures.

It will be seen from a comparison of the histograms in the figure that this small dose of aureomycin-fermentation factor was considerably more effective at 20 days than emetine gr. 15. The slight increase in failures after the 10th day, however, implies the likelihood of late relapse in some cases. The figures show that considerable success had been achieved.

Chlortetracycline in Small Doses

Since the aureomycin-fermentation factor was known to contain 80 mg. of chlortetracycline, we decided to test the effect of this small dose of the pure drug in a separate series. Accordingly 20 mg. of chlortetracycline was given 6-hourly for 10 days to nineteen patients. Again a remarkable effect was achieved at 10 days, 63% being successes and only 5·2% absolute failures. Over the test period, however, there was a progressive increase in absolute failures and cyst-passers until the 27th day, when the total parasitic failure-rate was 47%. It is to be specially noted that 20% of the total series were converted from active trophozoite-passers with ulceration though apparently successful at the 10th day, to symptomless cyst-passers at the 27th day.



Comparison of results of different treatments.

Streptomycin Residue

The streptomycin residue was given in doses of 4 g. daily and produced a definite though transitory effect. At 10 days 50% were successes and 40% absolute failures, but by the 27th day 50% were absolute failures and 10% cyst-passers.

Oxytetracycline Residue

The oxytetracycline-fermentation residue was given in doses of 4 g. daily for 10 days to ten patients. This was known to contain only 44 mg. of oxytetracycline, which was proportionately a much lower concentration of the supposedly active principle than in the aureomycin-fermentation factor. Here again the effect was very definite, with only 10% of failures at 10 days. This increased to 30% on the 27th day, with 60% successes. Follow-up a month later gave three (30%) successes and two (20%) relapsed absolute failures. The results given by this dosage of the terramycin residue do not differ significantly from those given by emetine and by aureomycin residue.

We have concluded from these trials that the efficacy of the fermentation residues probably rests in their content of the active antibiotic, and we decided to try the effect of continuing the small dose of aureomycin used previously with a systemic and an intraluminal amœbicide. Our object was to provide an inexpensive and effective treatment suitable for use in ambulant patients. Accordingly we gave the following course to forty-eight patients: (1) chlortetracycline 100 mg. for 10 days; (2) chloroquin diphosphate 500 mg. for 15 days; and (3) diiodohydroxyquinoline 1800 mg. for 20 days.

The results were extremely satisfactory. The figure shows that the high success-rate (85%) and low failure-rate (2%) on the 10th day were well maintained. On the 27th day the success-rate was 91% and the total failure-rate only 6%. A somewhat better than usual follow-up was obtained in this series owing to a special request made for the first time to the patient's employers. After a month twenty successes (40%) and one failure (2%)

reported. After two months eight successes (10%) and after three months four successes (8%) and one symptomless cyst-passer reported to the clinic. We therefore know that at least 8% of the patients treated by this method remained free from ulcers and parasites three months after the completion of treatment.

Control Series

For comparison with the series mentioned above we published (Armstrong et al. 1950) the figures of a "control" series of fifty cases observed in identical circumstances for the same length of time. Some years ago we were asked to assess the effects of two quack medicines, '260 D' and 'Chlorobexol,' which were widely advertised for the current "amæbophobia" by a commercial concern not connected with either the medical or the pharmaceutical profession. These preparations were alleged to contain uranium in a concentration of two parts per million, the remaining constituents being secret and undisclosed.

Forty patients were treated with one or other of these drugs, and ten were treated with nothing but an injection of calcium gluconate as a placebo. All were given normal hospital diet.

Since the two series were so similar, the figures have been combined into a single "control" series.

These patients all had open ulcers and trophozoites in their stools, but milder cases were chosen than in the other series, because of the expected inefficacy of the treatment.

The histograms (see figure) show the natural history of untreated amœbiasis under hospital conditions: a few patients (2% at 20 days, and 6% at 27 days) underwent spontaneous remission both of symptoms and physical signs. Ulcers healed and amœbæ disappeared from the stools. These findings are in accordance with those of Coxon (1948), who reported a 10% spontaneous remission-rate in nine cases treated only with placebos. These figures show that the results in all our treated cases were significantly better than in the untreated disease in identical circumstances.

Discussion

It will readily be seen from the histograms that fermentation residues of the antibiotics chlortetracycline, oxytetracycline, and streptomycin have a profound effect in modifying the relationship between the amœba and the host. A similar effect is found with very small doses of the pure parent antibiotic. Most of the patients were quickly relieved of their symptoms and ulceration, although with the passage of time symptomless cyst-passers appeared, showing that the infection has not been eradicated. This phenomenon was often seen during treatment with full doses of streptomycin or of chloramphenicol, when 40–50% became symptomless cyst-passers. This conversion of the invasive stage of amœbiasis to a phase of infestation without symptoms is very striking, and may well be of fundamental importance in our understanding of the ecology of amœbiasis.

It is tempting to suggest that perhaps the amœba which has previously been living as an invasive parasite inside the tissues has been induced by the antibiotic to revert to its rather more usual rôle of saprophyte in the intraluminal fæces (Hoare 1950). We know that many persons infected with amœbæ pass cysts in their stools for many years and yet remain free from symptoms. If we could explain why such patients are liable to a sudden attack of amœbic dysentery we would be a long way towards a full understanding of the varying relationship between host and amœba. We can now reproduce the reverse of this process in a high proportion of cases either by using an inadequate antibiotic, such as streptomycin and chloramphenicol in full doses, or by using an adequate antibiotic, such as chlortetracycline and oxytetracycline, in insufficient dosage.

Treatment with diiodohydroxyquinoline and very small doses of chlortetracycline has proved extremely effective. Statistically it is as good as any single or combined treatment which we have used in the past. We must admit, however, that, though very satisfactory, the clinical progress of individual cases and the appearances at sigmoidoscopy are not so rapid and dramatic as when the tetracycline compounds are used in full doses of 1 g. daily.

Though we are satisfied that the combined course is perfectly adequate for the usual cases of amœbiasis, whether they be symptomatic or asymptomatic cyst-passers or trophozoite-passers with or without acute dysentery, in truly fulminating cases and in those with chloride depletion or with impending perforation we would use larger doses of a tetracycline compound. The combined course would lose nothing by substituting, for example, 4 g. of the chlortetracycline-fermentation factor for the 100 mg. of pure chlortetracycline. This would further reduce the price. A further suggestion would be the compounding of a capsule or tablet containing all three drugs to be administered three times daily. We feel that this combination can be used for the mass treatment of large numbers of African cases. It has the great advantage that it can be used for ambulant outpatients and requires neither rest in bed nor stay in hospital.

Summary

The fermentation residues of chlortetracycline and oxytetracycline are potent amœbicides.

This effect is probably due to their content of chlortetracycline and oxytetracycline, which in doses of 100 mg. daily are as immediately effective as emetine.

Small doses of these two antibiotics, or large doses of chloromycetin or of streptomycin, often convert severe dysenteric amœbiasis into symptomless cyst-passing. The implications of this are discussed.

A combination of chloroquine and diiodohydroxyquinoline and either chlortetracycline 100 g. or chlortetracycline residue 4 g. is a highly effective and inexpensive ambulant treatment for amœbic dysentery, excepting severe cases and those with complications.

Our thanks are due to the Council for Scientific and Industrial Research, the Natal Provincial Administration, and the University of Natal for their support. Lederle Laboratories Division, the Pfizer Corporation, and Glaxo Laboratories kindly supplied the residues.

REFERENCES

Armstrong, T. G., Marot, J. T., Elsdon-Dew, R. (1950) *S. Afr. med. J.* **24**, 121.
Barnard, R. D. (1951) *Lancet*, i, 1157.
Coxon, R. V. (1948) *J. R. Army med. Cps*, **91**, 243.
Elsdon-Dew, R., Armstrong, T. G., Willmot, A. J. (1952) *Lancet*, ii, 104.
Hoare, C. A. (1950) *Brit. med. J.* ii, 238.

A SHORT LABORATORY SCREENING TEST FOR PHÆOCHROMOCYTOMA

R. MOULTON
B.A. Camb.

D. A. WILLOUGHBY

From the Department of Applied Pharmacology, Medical Unit, University College Hospital Medical School, London

THE recognition that a phæochromocytoma can produce a curable form of hypertension has led to increased clinical interest, but the increase in the number of cases reported is chiefly due to improved methods of diagnosis, The clinical pharmacological tests—e.g., the phentolamine ('Rogitine'), piperoxan ('Benzodioxane'), and histamine tests—have all proved useful, but false positive and false negative results have been reported with each of them (Goldenberg et al. 1954, Symington and Goodall 1953).

Engel and von Euler (1950) found increased urinary excretion of adrenaline and noradrenaline in patients with a phæochromocytoma, and suggested that this might be the most reliable aid to diagnosis.

The normal daily output of pressor amines is less than 63 μg. per 24 hours (von Euler et al. 1954). Most patients with a phæochromocytoma excrete more than 250 μg. of pressor amines per 24 hours, and many as much as 1–3 mg. per 24 hours; and a few have excreted less than 200 μg. per 24 hours (Burn 1953). In essential hypertension von Euler (1952) found that the daily urinary excretion of pressor amines was usually less than 100 μg. per 24 hours but occasionally as much as 200 μg. per 24 hours. He has also reported increased amounts in anxiety states (von Euler 1954). A rapid method for the estimation of adrenaline and noradrenaline is therefore needed as a screening test for phæochromocytoma.

The method used by Engel and von Euler (1950) consisted essentially in a preliminary adsorption on to aluminium hydroxide followed by testing its effect on the cat's blood-pressure and the hen's cæcum to differentiate between adrenaline and noradrenaline (von Euler and Hellner 1951). Burn (1953) used a similar method in three cases of phæochromocytoma. Fluorimetric methods have also been used to estimate adrenaline and noradrenaline (Lund 1950, Goldenberg et al. 1954, Weil-Malherbe and Bone 1953).

von Euler (1951, 1953) suggested that the effect of untreated urine on a cat's blood-pressure might be used as a screening test. We have developed this technique and, with pharmacological modifications, have used it successfully in 250 cases of hypertension from this and other hospitals. We have found or confirmed 7 cases of phæochromocytoma and believe that this is a reliable screening test for use in a large hypertension clinic.

Collection of Urine

Either random samples or aliquots of 24-hour specimens may be used. Urine should be passed directly into a sterile jar containing 50 mg. of ascorbic acid as antoxidant. Samples are stored at 0°C until the test can be made. Contamination by bacteria, which may produce histamine, should be prevented.

Preparation of Cat

Assays are done on a cat's blood-pressure preparation. The cat is anæsthetised with intraperitoneal pentobarbitone ('Nembutal') 35 mg. per kg. of body-weight. A cannula is placed in the trachea because artificial respiration helps to maintain a steady base-line. Injections are made through a cannula placed in a femoral vein. A recording cannula is inserted in a carotid artery. This cannula is siliconed with 'Midland Silicone (D.C. 200)' and about 0·25 ml. of a 1% heparin solution is placed in the tip to prevent clotting. The cannula is next connected to a mercury manometer with a float recorder, which traces the blood-pressure on a smoked drum.

Assay

Samples are neutralised and then assayed against standard adrenaline and noradrenaline in normal urine. The injection volumes of both the unknown and standard are kept constant at either 0·5 ml. or 1·0 ml. and washed in with a constant volume of saline solution containing 9 g. of sodium chloride per litre.

All the samples are assayed at least twice during a period when the cat is sufficiently sensitive. Cats vary considerably in their sensitivity both from one to another and from time to time during the assay.

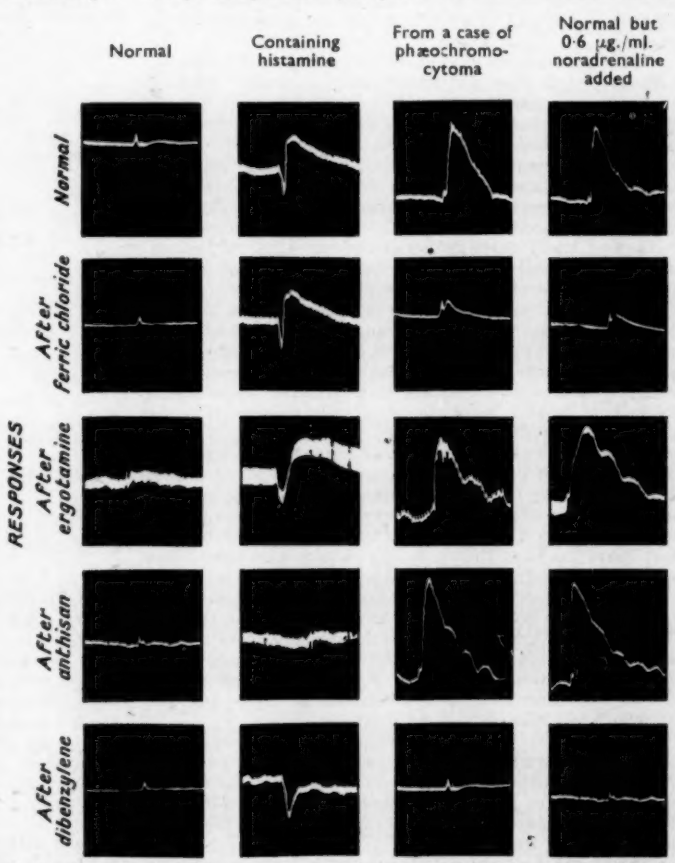
The great majority of the samples have little or no effect on the blood-pressure and so do not need further investigation. If a response is equal to or greater than 0·1 μg. per ml. of adrenaline or noradrenaline, further tests (see figure) are made as follows:

(1) *Destruction of Adrenaline and Noradrenaline.*—An aliquot of the urine is adjusted with *N* sodium hydroxide to pH 10 and, after the addition of a drop of 1% ferric chloride, is boiled in a water-bath for 15 minutes. The solution is then cooled, neutralised with *N* hydrochloric acid, and assayed again. If the unknown pressor substance is adrenaline or noradrenaline it will be oxidised by this procedure and its pressor activity greatly diminished.

(2) *Modification of Response by Drugs*

(*a*) Intramuscular *ergotamine tartrate* in a dose of 0·25 mg. is reported to potentiate the response to adrenaline (Dunér 1953). We have found this rather inconstant, but at least the shape, if not the height, of the response curve is altered. If the alteration in response of the unknown parallels that of the standards it is considered as further evidence of its identity.

(*b*) Intravenous *mepyramine maleate* 5 mg. occasionally potentiates the response to adrenaline and noradrenaline but always antagonises any response to histamine. Histamine is



Modifications of cat's blood-pressure response to intravenous injection of urine (0·5 ml.) as described in the text. The response to urines containing histamine is variable.

URINARY EXCRETION OF PRESSOR AMINES IN 7 PROVED CASES OF PHÆOCHROMOCYTOMA

Case no.	Sex	Pressor amine excreted in 24 hr.
1	M	2·0 mg. expressed as noradrenaline
2	F	2·0 mg. "
3	F	3·0 mg. "
4	F	1·0 mg. "
5	M	2·0 mg. "
6	M	0·8–1·0 mg. "
7	F	0·3 mg. of adrenaline

the contaminant causing the greatest difficulty because pure depressor, pure pressor, or mixed responses can be produced. Sometimes the response closely mimics that of adrenaline and noradrenaline.

(c) Phenoxybenzamine hydrochloride (' Dibenzylene ') is a potent antagonist of adrenaline and noradrenaline, and, since its effect is maintained for at least an hour, it is only given (5 mg. intravenously) towards the end of the assay.

The purpose of giving these three drugs is to show that the response of the unknown pressor substance in the urine is modified in the same way and to the same extent as that of the standards. Typical responses taken from actual tests are shown in the accompanying figure.

Results

We have investigated the urinary excretion of adrenaline and noradrenaline by 250 patients with hypertension from this and other hospitals. During this study we either found or confirmed 7 cases of phæochromocytoma, all showing raised urinary levels of pressor amine (see table). The diagnosis was in each case subsequently proved at operation.

Of the 250 samples examined 200 came from University College Hospital and 50 from other hospitals. Most of these samples were from patients who had severe hypertension or were strongly suspected on clinical grounds of having a phæochromocytoma.

In the hypertension clinic at University College Hospital urine is now sent for routine assay from all cases of malignant hypertension and from any other cases in which there is clinical suspicion of phæochromocytoma.

In 6 of the 7 cases detected the excretion of pressor amine was well within the range considered to be pathognomonic of phæochromocytoma. In case 7 assay repeatedly showed levels strongly suggesting a tumour but possibly not beyond the range of an anxiety state with essential hypertension. We identified the abnormal pressor substance in this case as adrenaline because the cat gave a depressor response to adrenaline while maintaining a pressor response to noradrenaline. This is unusual in our preparations.

Several patients with essential hypertension excreted 100–150 μg. of pressor amine in the urine in 24 hours. Borderline cases like these are checked by repeat assays; and, if the hypertension is paroxysmal, specimens passed after an attack are tested. So far none of these borderline cases has been shown to have a phæochromocytoma and we have had no proved false positive or false negative.

In the presence of ascorbic acid adrenaline and noradrenaline do not deteriorate in urine kept at 0°C for 14 days. At room-temperature there is no loss for 2 days, and we have successfully diagnosed phæochromocytoma from specimens sent by post. Hydrochloric acid (about 0·5 ml. of concentrated hydrochloric acid per 100 ml. of urine) can also be used as a preservative.

The most satisfactory animals for this preparation were non-pregnant cats weighing about 2 kg.

The average preparation is sensitive down to 0·1 μg. of adrenaline or of noradrenaline per ml. and, although less specific than the longer methods, has been adequate as a screening test.

The longer methods include acid hydrolysis to estimate conjugated adrenaline and noradrenaline. Our method could be adapted to include hydrolysis, but only with the disadvantage of considerably lengthening the method.

von Euler et al. (1953) tested the effect of untreated urine from a patient with phæochromocytoma on a cat's blood-pressure and found the results in very good agreement with those obtained by Lund's fluorimetric method.

It is possible to assay at least 20 specimens on one cat, negative results being especially quickly obtained and confirmed.

This rapid method should be of use in departments with limited time and staff. It is obviously only suitable for use in a large hypertension clinic or in a centre receiving many samples.

Summary

A rapid screening test for phæochromocytoma by bio-assay of untreated urine on the cat's blood-pressure preparation is described.

Samples from 250 cases of hypertension were investigated, and 7 cases of phæochromocytoma were found or confirmed.

No false negative or false positive result has so far occurred.

We wish to thank Dr. D. R. Laurence, Prof. M. L. Rosenheim, and Prof. W. D. M. Paton for their help and encouragement.

REFERENCES

Burn, G. P. (1953) *Brit. med. J.* i, 697.
Dunér, H. (1953) *Acta physiol. scand.* **28**, Suppl. 102.
Engel, A., von Euler, U. S. (1950) *Lancet*, ii, 387.
Goldenberg, M., Serlin, I., Edwards, T., Rapport, M. M. (1954) *Amer. J. Med.* **16**, 310.
Lund, A. (1950) *Acta pharm. tox., Kbh.* **6**, 137.
Symington, T., Goodall, A. L. (1953) *Glasg. med. J.* **34**, 75.
von Euler, U. S. (1951) *Ann. Surg.* **134**, 929.
— (1952) *Scand. J. clin. Lab. Invest.* **4**, 254.
— (1954) *Pharmacol. Rev.* **6**, 15.
— Hellner, S. (1951). *Acta physiol. scand.* **22**, 161.
— — Purkhold, A. (1954) *Scand. J. clin. Lab. Invest.* **6**, 54.
— Lund, A., Olsson, A., Sandblom, P. (1953) *Ibid*, **5**, 122.
Weil-Malherbe, H., Bone, A. D. (1953) *Lancet*, i, 974.

MITRAL INCOMPETENCE IN EXPERIMENTAL AURICULAR FIBRILLATION

RAYMOND DALEY
M.A., M.D. Camb., M.R.C.P.
PHYSICIAN

IAN K. R. MCMILLAN
M.A., M.B. Camb.
MCKENZIE MCKINNON FELLOW OF THE ROYAL COLLEGE OF SURGEONS

CARDIAC DEPARTMENT, ST. THOMAS'S HOSPITAL, LONDON

RICHARD GOBLIN
M.D. Harvard
MOLESEY TRAVELLING FELLOW, PETER BENT BRIGHAM HOSPITAL, BOSTON

SINCE mitral valvotomy has been developed there has been a great deal of clinical and experimental investigation into the differential diagnosis of mitral stenosis and incompetence. These investigations have led to clearer understanding of most patients on clinical grounds alone, but there remain some patients in whom the recording of left auricular pressure by cardiac catheterisation or by direct auricular puncture through a bronchoscope is an important investigation. The interpretation of these curves of left auricular pressure is often difficult, especially when auricular fibrillation is present. We suggest that one of these difficulties is that mitral incompetence commonly accompanies auricular fibrillation in patients in whom there is no organic incompetence of the mitral valve.

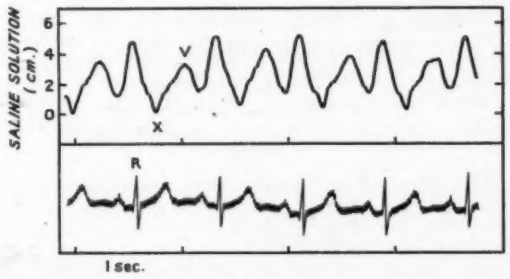


Fig. 1—Upper tracing is of normal left auricular pulse. Lower tracing is a lead-II electrocardiogram. Peak of left auricular pressure just precedes R wave of electrocardiogram and is followed by sharp decrease in pressure (X wave) and climbing V wave.

There is considerable similarity between the curves of left auricular pressure pulse in patients with mitral incompetence with normal sinus rhythm and those in patients with auricular fibrillation with or without evidence of mitral incompetence. The normal left auricular pulse is shown in fig. 1. During auricular fibrillation there is no sharp descent from the crest of the C wave and a climbing dome-shaped wave unites the C and V waves (fig. 2). This has never been explained satisfactorily. Fig. 3 is a record obtained by left auricular puncture with the chest open in a patient in whom acute mitral incompetence was accidentally produced during mitral valvotomy. Again there is a climbing C wave without early descent—the X wave is absent.

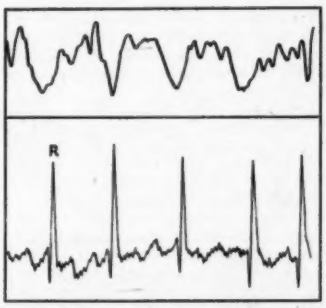


Fig. 2—Upper tracing is of left auricular pulse during auricular fibrillation shown in electrocardiogram below. The X descent is superseded by climbing wave immediately after R wave of electrocardiogram.

From these observations we felt that there might be a relationship between auricular fibrillation and mitral incompetence, and this we investigated in dogs.

Method

In 27 dogs under pentobarbitone-sodium anæsthesia with open chest and pericardium removed the left atrium was needled and the pressure recorded. Auricular fibrillation was then induced by applying the electrodes of a standard physiological induction coil to the vicinity of the sino-auricular node. Pressures were again recorded while simultaneous electrocardiograms were taken. When normal rhythm had returned, a small copper-wire cage was placed in the orifice of the mitral valve in 5 dogs, thus holding the valve cusps apart and producing acute mitral incompetence, and the left auricular pressure was recorded. The left ventricle and auricle were simultaneously needled. During normal rhythm 1% Evans-blue was injected into the left ventricle while blood was withdrawn from the left auricle. After time had been allowed for recirculation of the dye, a control sample of blood was obtained from the left auricle. Dye was then injected into the left ventricle, and blood was withdrawn from the left auricle during auricular fibrillation. The experiment was repeated with the wire cage in place in the mitral valve. In 3 dogs the whole procedure was done with the pericardium intact apart from a small aperture 1 cm. in length over the right auricle to allow application of electrodes. The blood samples containing dye were heparinised and centrifuged, and the supernatant serum was estimated colorimetrically in 10 dogs.

Results

Pressure Records

The normal left auricular pressure-pulse in the dog is qualitatively similar to that in man. Likewise during auricular fibrillation and in normal rhythm with induced mitral incompetence the basic pattern was similar.

Injections of Dye

In normal rhythm, when Evans-blue was injected into the left ventricle it was not recovered from the left auricle, demonstrating the expected competence of normal mitral valves both when the pericardium was removed and when it was intact. Before dye was injected into the left ventricle, the position of the needle in the ventricular cavity was confirmed by the withdrawal of oxygenated blood. Subsequent "control" samples of blood after recirculation showed that the dye was injected into the circulation.

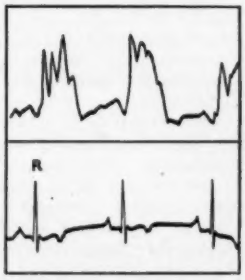


Fig. 3—Upper tracing is of left auricular pulse. Lower tracing is electrocardiogram. Record was obtained by left auricular puncture in a patient in whom mitral incompetence was accidentally produced at operation. Again there is no X descent but a climbing wave following R wave of electrocardiogram.

In auricular fibrillation, when Evans-blue was injected into the left ventricle during auricular fibrillation it was recovered from the left auricle, demonstrating incompetence of the mitral valve (fig. 4). This incompetence was present both with the pericardium removed and when it was intact. There was such regurgitation of dye from the left ventricle into the left auricle, when the wire cage was in the mitral valve, that colorimetric estimation of the quantity of dye in the auricular blood was unnecessary.

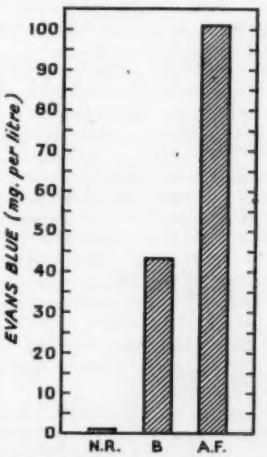


Fig. 4—Amount of Evans-blue recovered from auricle after injection into left ventricle: A.F., quantity of dye found in left auricular blood immediately after injection into left ventricle during auricular fibrillation. B, quantity of Evans-blue in left auricular blood after time was allowed for recirculation. N.R., incalculable quantity immediately recovered during normal rhythm. Similar results were obtained in all dogs.

Discussion

From these observations in dogs it appears that auricular fibrillation is accompanied by mitral incompetence, and that this is independent of the presence or absence of the pericardium. The degree of incompetence is very variable but nevertheless it is always present.

In the conduct of these experiments particular care was needed to avoid false results by malposition of the ventricular needle. If the needle is placed too high in the left ventricle, the posterolateral cusp of the mitral valve may be transfixed and the injection made directly into the mitral funnel. Alternatively, if the needle is placed too high in the outflow tract, the dye will be discharged

directly into the aorta. To guard against these possibilities the needle was placed from below into the lower half of the ventricular cavity. The injections were made into the same area both during normal rhythm and during auricular fibrillation. The auricular needle was placed through the auricular appendage into the main body of the auricle and again remained in the same position whether the rhythm was normal or auricular fibrillation was present.

Similar experiments were made on the right side of the heart; but, owing to the crescentic shape of the right ventricular cavity, it was technically difficult to place the ventricular needle correctly. The tricuspid valve appeared to behave as the mitral during auricular fibrillation.

There have been a few prior observations suggesting the occurrence of valvular insufficiency with auricular fibrillation. Prinzmetal et al. (1952) observed dilatation of the left auricle in experimental auricular fibrillation. This increased auricular volume could have been due to (1) left ventricular failure (not seen in our studies); (2) altered atriovenous volume elasticity characteristics; or, most probably, (3) acute valvular insufficiency. Müller and Shillingford (1954) suggested that tricuspid insufficiency developed in a patient with auricular fibrillation and disappeared with reversion to normal rhythm.

Why mitral insufficiency develops here is unknown. Little (1951) showed that the closing of the auriculo-ventricular valve depended on auricular systole. The slight "jog" in auricular and ventricular pressure with either momentary reversal of auriculo-ventricular gradient or creation of eddy currents leads to rapid apposition of valve cusps. In the absence of auricular systole the leaflets close slowly and regurgitation probably occurs *early* in systole, obliterating the negative systolic dip.

Possibly the decreased stroke output and the frequent failure of output to increase on effort, as often happens in auricular fibrillation, may be as much related to regurgitation, especially if there is the associated hydraulic restriction of stenosis, as to loss of ventricular filling from auricular systole.

Interpretation of significant (organic) valvular insufficiency is thus rendered difficult in the presence of auricular fibrillation.

Conclusions

Dogs were studied in normal sinus rhythm and during induced auricular fibrillation. Auricular and ventricular pressures were recorded, and Evans-blue was injected into the left ventricle and collected from the left auricle.

Auricular fibrillation led to loss of the mid-systolic dip of the auricular pressure pulse and acute incompetence of the auriculo-ventricular valve.

The acute incompetence was presumably related to absence of auricular systole, with sluggish valve apposition at the onset of ventricular contraction.

Auricular fibrillation may lead to mitral incompetence in man and not only be a further disadvantage to patients with mitral stenosis but also explain why some patients with "idiopathic fibrillation" may occasionally develop cardiac failure.

Our thanks are due to the Endowment Fund of St. Thomas's Hospital; Miss M. Lavers and Mr. F. Schofield for technical assistance; and Mr. R. J. Hirst for the colorimetric estimations.

REFERENCES

Little, R. C. (1951) *Amer. J. Physiol.* **166**, 289.
Müller, O., Shillingford, J. (1954) *Brit. Heart J.* **16**, 195.
Prinzmetal, M., Corday, E., Brill, I. C., Oblath, R. W., Kruger, H. E. (1952) The Auricular Arrhythmias. Springfield, Ill.

ETHYL BISCOUMACETATE AS AN INHIBITOR OF SICKLING

F. E. D. GRIFFITHS
T.D., M.B. Lpool, D.T.M. & H.
PATHOLOGIST, MARSTON GREEN MATERNITY HOSPITAL, NEAR BIRMINGHAM

THE inheritance of homozygous sickle genes carries with it the promise of early death for most sufferers. Any possible means of brightening this prognosis is worthy of full investigation.

For this reason, and this alone, the observations discussed in this paper are recorded—in the hope that those who are able to get greater supplies of cells capable of sickling may confirm or deny these findings.

Case-record

The patient, a Jamaican negress, had suffered from what appeared to be a typical sickle-cell crisis at the birth of her first child. Investigation of her hæmoglobin showed the sickle-trait pattern, S–A. The electrophoretic pattern was determined in three different hospitals, and on each occasion was found to be the same.

The birth of a second child, though free from hæmolytic complications, was followed by a femoral thrombosis. Ethyl biscoumacetate ('Tromexan') therapy was instituted, and on the last day of treatment with this drug the prothrombin level was 40% of normal.

Three days after the last dose, blood was taken for experiments on the sickling properties of various concentrations of thioglycollate (Griffiths and Grimshaw 1955). Heparinised blood was put up in vaseline-sealed smears without thioglycollate as a normal control. Repeated observations on previous occasions, using the blood of the same patient, had shown that sickling could be completed in twenty-four hours at 37° C, forty-eight hours at room-temperature, both without added anticoagulant, and up to seventy-two hours with added oxalate or heparin.

On this occasion, the blood, which normally showed 80–90% sickling after these time intervals, showed no sickling at all for the first twenty days. The cells were observed at least twice a day each day. From the twenty-first to the twenty-fifth days a few cells sickled, but in no field observed were the sickled cells more than 4% of the total red cells in a given field.

The patient was seen again five weeks after discharge from hospital. No drug had been given during this time. Vaseline-sealed smears were made of the patient's blood from heparinised tubes (10 i.u. of heparin per ml. of blood), with and without ethyl biscoumacetate (10 mg. per 100 ml. in sterile isotonic saline solution).

On this occasion the normal control showed sickling of 90% of the red cells to be complete in seventy-two hours. At the end of twenty-six days the cells with ethyl biscoumacetate showed less than 1% sickling. After this time the cells began to disintegrate.

Discussion

Murphy and Shapiro (1945) have described the use of both dicoumarol and heparin at the time of crisis in a patient known to have sickle anæmia. With heparin, the crisis appeared to have been intensified, and with dicoumarol although no effect was recorded, in two out of three crises the clinical behaviour was described as "atypical." No observations on the sickling process whilst under treatment with dicoumarol and/or heparin or aspirin are mentioned.

Although crises in sickle anæmia may be "atypical" ab initio, it is interesting that two of three treated crises should be so described. As the crises begin abruptly, and the capillary blockage is simultaneous, it seems that a rapidly acting anticoagulant would be effective. The illustration of the muscle biopsy in Murphy's article suggests that a fibrin network is the basis of coagulation, as opposed to simple agglutination. The time factor may be important in this respect, however, and simple agglutination may have preceded fibrin formation; in which case a rapidly acting anticoagulant might be

important in preventing fibrin formation. Small static erythrocyte formations in capillaries may release free thrombin and thromboplastin into the circulating plasma (and the hyperfibrinogenæmia disclosed by electrophoresis supports this view).

Henderson (1951), using dicoumarol in one patient in a sickle crisis, noted that transitory pain was not diminished, and that neither diet nor methylene-blue had any effect on the course of the disease.

As Murphy and Shapiro (1945) point out, "All erythrocytes of a subject with the asymptomatic sickle trait are capable of assuming the abnormal form and differ from those of persons who exhibit the crises only in that they (the former) possess a higher threshold of sickling." A sickle crisis is probably a vicious circle of sickling/small thrombosis/thrombin and thromboplastin release/larger thrombosis, until the old erythrocytes are lysed and replaced by younger and more robust ones.

Henderson (1951) has pointed out that the symptom-sign complex in sickle anæmia is protean, and variations in sickling may be encountered.

In our case, two forms of treatment modified the sickling process. One was blood-transfusion, which was probably a matter of simple dilution by non-sickling blood. Although the time of sickling was not affected, the proportion of cells that sickled was reduced to approximately 50–60%. With ethyl biscoumacetate not only was the proportion of sickled cells materially reduced from 80–90% to less than 1%, but the time of sickling of the small number of cells was increased from three days to twenty-six days.

Ethyl biscoumacetate and phenindione ('Dindevan') have now replaced dicoumarol in the treatment of intravascular thrombosis, largely because of their greater margin of safety and the decreased incidence of hæmorrhagic sequelæ. The mode of action of ethyl biscoumacetate has been shown by Hunter and Tudhope (1953) to be to lessen the concentrations of factor VII and prothrombin in the blood, but other effects, for instance, anti-vitamin-K activity, are as yet incompletely understood. Although there is general agreement that withdrawal of ethyl biscoumacetate shows a significant reduction in prothrombin-time after forty-eight hours, I can find no help from a survey of the literature, on the side-effects, and their persistence, occurring after administration of this drug. There has been disagreement as to the effect of dicoumarol as an antagonist of vitamin K (Cromer and Barker 1944, Quick 1942).

Phenindione is a synthetic anticoagulant, the efficiency of which has been investigated by Blaustein (1950), Preston et al. (1952), and by Toohey (1953). The drug is indicated where prolonged hypocoagulability of the blood is required. Owren (1954) prefers it because of its smoother control, particularly in long-term treatment.

Although sickle anæmia is basically a defect of hæmoglobin, the clinical effects are those of thrombo-embolism. It would appear, therefore, that anticoagulants should have some part to play in the treatment of these effects. As *The Lancet* (1954) has pointed out, long-term anticoagulant therapy has been practised only by a few enthusiasts, and then within only a very narrow spectrum of thrombo-embolic disorders confined to vascular diseases.

A trial of the newer anticoagulants seems to be justified in:

(1) Cases showing frequent sickle crises, to determine whether frequency is diminished or modified by long-acting drugs.

(2) Sickle crises when they occur, to evaluate the action of short-acting drugs in minimising the thrombo-embolic effects of such attacks.

The observations recorded here, although very limited in scope, do seem to indicate the need for a fuller investigation of the actions of the coumarin derivatives, and, in particular, their actions on the metabolism of abnormal forms of hæmoglobin.

My thanks are due to Dr. William Whitelaw, director of pathology in the Dudley Road group of hospitals, for his constant advice and encouragement, and to Mr. William Grimshaw, for considerable technical assistance.

REFERENCES

Blaustein, A. (1950) *Canad. med. Ass. J.* **62**, 470.
Cromer, H. E., Barker, N. W. (1944) *Proc. Mayo Clin.* **19**, 217.
Griffiths, F. E. D., Grimshaw, W. (1955) *J. clin. Path.* (in the press).
Henderson, A. B. (1951) *Amer. J. med. Sci.* **6**, 628.
Hunter, R. B., Tudhope, G. R. (1953) *Lancet*, i, 821.
Lancet (1954) ii, 743.
Murphy, R. C., Shapiro, S. (1945) *Ann. intern. Med.* **3**, 376.
Owren, P. (1954) *Schweiz. med. Wschr.* **84**, 822.
Preston, F. W., O'Connor, W. R., Thompson, C. E., Christensen, E. N. (1952) *Circulation*, **6**, 615.
Quick, A. J. (1942) The Hæmorrhagic Diseases and the Physiology of Haemostasis. Springfield, Ill.
Toohey, M. (1953) *Brit. med. J.* i, 650.

Preliminary Communication

ELECTIVE CARDIAC ARREST

THE goal of cardiac surgeons must be the unhurried correction of cardiac abnormalities under direct vision. Toward this end are being developed many techniques for working within the bloodless heart and for excluding the possibility of air embolism after such interventions. Among these measures against air embolism is the induction of ventricular fibrillation in order to prevent the ejection by the heart of any air that may be within its cavities [1] and the alternative of closing the cardiac wound under saline.[2] A most valuable contribution to this problem and indeed to the whole problem of intracardiac surgery would be made if the heart could be arrested and re-started at will, suffering no damage during periods of arrest and cessation of coronary blood-flow.

Ringer [3] drew attention in 1883 to the effect of the different cations on the heart-beat, and Hooker [4] in 1929 suggested that potassium inhibition induced by an excess of potassium chloride could be used to stop the heart when its beat was disorganised by ventricular fibrillation. He recommended a solution of calcium chloride as an antidote to potassium when re-starting the heart. This work has been revived by Montgomery et al.[5] in order to reverse ventricular fibrillation in hypothermic patients. We have not been able fully to substantiate these findings but have, by modifying this basic technique, succeeded in evolving a reliable method of stopping and re-starting the heart at both normal and reduced body-temperatures.

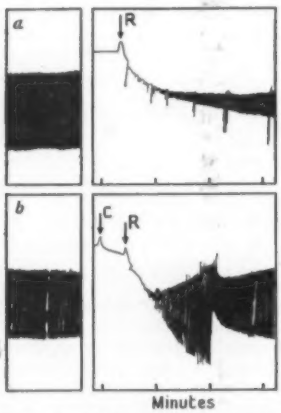
METHODS AND RESULTS

Initial Experiments

Thirty-three adult dogs, anæsthetised with thiopentone and ether, were used to determine whether the induction of cardiac arrest by chemical means was a practical measure. While the vital centres were protected by perfusion with a heart-lung machine [6] or by reduction of the general body-temperature, cardiac arrest was induced by an injection of potassium citrate into the coronary circulation. Blood was excluded from the heart by ligating the venous inflow tracts and also the pulmonary artery and aorta. The injection of potassium citrate in concentrations varying from 25 to 100 mg.

1. Senning, A. *Acta chir. scand.* 1952, suppl. 171.
2. Swan, H., Zeavin, I., Holmes, J. H., Montgomery, A. V. *Ann. Surg.* 1953, **138**, 360.
3. Ringer, S. *J. Physiol.* 1883, **4**, 29.
4. Hooker, D. R. *Amer. J. Physiol.* 1929, **91**, 305.
5. Montgomery, A. V., Prevedel, A. E., Swan, H. *Circulation*, 1954, **10**, 721.
6. Melrose, D. G. *J. Physiol.* 1955, **127**, 51P.

per ml., was made into the root of the aorta. Arrest in diastole followed within five seconds. When this was accomplished a token operation was performed within the left atrium or ventricle. The heart was quite flaccid and could be freely handled, making the elimination of air an easy task when resuturing the cardiac wound. In no instance did air embolism occur. While the heart was stopped without coronary blood-flow for at least fifteen minutes, the heart remained pink and serial oxygen determinations on blood obtained from the coronary sinus showed that a negligible amount of oxygen was being utilised. When the period of arrest had exceeded fifteen minutes blood was allowed to re-enter the heart, and efforts were made to restore a normal beat. Cardiac massage, combined with the injection of calcium chloride, and in some cases of adrenaline and neostigmine, always restored muscle tone, and this was followed in almost every case by ventricular fibrillation. Electrical defibrillation was successful in only 70% of experiments and the restoration of normal activity was not reliable.



Perfused rabbit heart, 37°C: ventricular recording (systole downwards).

(*a*) Left, normal beat. Right, resumption of beat by re-starting perfusion; cardiac arrest 6 min. previously by stopping perfusion.

(*b*) Left, normal beat. Right, resumption of beat by re-starting perfusion; cardiac arrest previously by potassium citrate; perfusion stopped for 15 min.

R = restoration of perfusion with Locke's solution. C–R = change-over from citrated to normal solution.

These results were unsatisfactory and it was felt that the questions of duration and reversability of action of potassium citrate, and the need for stimulants, might profitably be studied further on isolated-heart preparations.

Isolated Perfused Hearts

Coronary perfusions of hearts from five rabbits, a guineapig, a kitten, and a puppy were made with oxygenated Locke's solution by the Martin-Langendorff method of aortic cannulation. The apparatus maintained the chosen cardiac temperature, usually 37°C, even in the absence of any coronary flow.[7] A few experiments were made between 23° and 37°C. Heart-beats were recorded by a spring-loaded lever attached by thread to the ventricles.

The injection of 10–40 mg. of potassium citrate in 0·2–0·4 ml. close to hearts with coronary flows of 10–20 ml. per minute stopped the beat. By perfusion with Locke's solution with previously added potassium citrate, 1 mg. per ml. was found to be the least which could stop the heart; but in some a just-discernible auricular movement persisted. However, 5 mg. per ml. always caused complete arrest, and concentrations of up to 20 mg. per ml. were used to determine the dosage safety-margin. Diastolic cardiac arrest always occurred within ten to twenty seconds of injection of the solutions, and could be maintained as long as the heart contained them. During this period coronary flow was stopped for fifteen minutes without cardiac damage appearing subsequently. Spontaneous beating started again usually within ninety seconds of perfusion with pure Locke's solution, but with the highest concentrations of potassium citrate this interval doubled. The heart-rate was normal in under a minute, and force was almost fully recovered in a further two to three minutes. This series of events was perfectly repeatable, and the time of arrest could be prolonged; one fair recovery followed even fifty-five minutes of induced arrest without perfusion. By contrast, hearts in which the beat was stopped by asphyxia, induced by stopping the coronary flow without the addition of potassium citrate, recovered very slowly and then only partially after only five minutes of arrest (see figure). No hearts fibrillated as a result of the potassium citrate combined with coronary arrest—not even the puppy heart which had originally to be defibrillated as soon as it was set up—and on no occasion did a heart so treated fail to resume normal beating after perfusion with pure Locke's solution.

Final Experiments

Encouraged by the results of isolated heart perfusions we modified the initial experiments in the intact animal and established the following technique.

In dogs weighing about 30 lb., 2 ml. of a 25% solution of potassium citrate, diluted to 20 ml. by aspiration of blood into the syringe, was injected through a catheter into the ascending aorta, which was occluded distal to the tip of the catheter. After cardiac arrest for fifteen minutes oxygenated blood was driven through the coronary arteries from the heart-lung machine by release of the aortic clamp. This effectively restored a normal environment to the heart, which responded by a resumption of strong and regular contractions. In an animal protected by a reduction of the body-temperature to 25°C, coronary perfusion was achieved by connecting the catheter in the aorta to a bottle containing fresh oxygenated blood under pressure, without release of the aortic clamp. In this instance a single electric shock was required to restore normal rhythm.

CONCLUSIONS

Cardiac arrest in diastole inevitably results from an injection of potassium citrate into the root of the aorta so that the bulk of it enters the coronary arteries.

The dose of potassium citrate is critical in that a minimum coronary blood-level of 1 mg. per ml. is required to stop the heart, but as yet no upper limit for safety has been determined.

Arrest is maintained as long as an adequate level of potassium citrate remains in the coronary arteries.

Normal beat is restored when simple perfusion of the coronary circulation reduces the level of potassium citrate.

The method is effective both at normal body-temperature and at temperatures down to 26°C, while the perfused isolated heart is responsive at temperatures down to at least 23°C.

The addition of stimulants, such as calcium chloride or adrenaline, is unnecessary and may be dangerous.

The oxygen consumption of the quiescent heart is very low, and at normal body-temperature cessation of the coronary circulation for over fifteen minutes does not endanger such a heart.

Although a great deal of further work remains to be done, this method may offer an opportunity for useful surgery on the motionless heart, without the danger of air embolism.

D. G. MELROSE
M.A., B.M. Oxfd
B. DREYER
M.D. Cape Town, F.R.C.S.
Department of Surgery, Postgraduate Medical School of London
H. H. BENTALL
M.B. Lond., F.R.C.S.
Department of Physiology, Charing Cross Hospital Medical School, London
J. B. E. BAKER
M.A., B.Sc., B.M. Oxfd

7. Baker, J. B. E. *Ibid*, 1951, **115**, 30P.

New Inventions

A SIMPLE PROJECTION APPARATUS

IT is often an advantage to illustrate ward rounds and tutorials with histological sections; but the practice becomes tedious if each member has to wait his turn to use the microscope. The same criticism applies to using microscopes with double demonstration eyepieces, and multiple-eyepiece instruments have the disadvantage of being cumbersome.

The projection apparatus described here has been devised to meet these objections. It can be used in two ways:

Fig. 1—Viewing-box and metal hood in position.

(1) *Without the viewing-box.*—The room is darkened, and the members of the group sit round the horizontal screen. A strip-light above the book-rest enables the operator to identify slides or consult case-records. Used in this way the apparatus has proved valuable during discussions with surgical colleagues on pathological sections from their cases.

(2) *With the viewing-box* (fig. 1), for teaching surgical histology at the bedside. The projected image can be studied by three to six persons without darkening the ward, and even with a light immediately overhead. No projectionist is required. A pointer is incorporated in the viewing-box for use by the teacher.

No new principles are involved in this apparatus, which consists essentially of a microscope set horizontally, and fitted with a prismatic attachment which throws the image on to a horizontal screen (fig. 2).

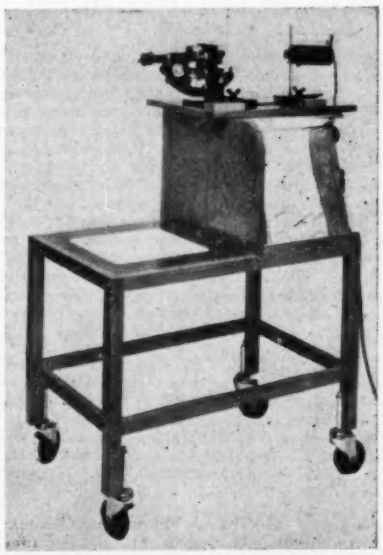


Fig. 2—Apparatus with viewing-box and metal hood removed.

Any microscope may be employed, but one advantage of using the microscope and illuminant of Cooke Troughton & Sims is that the makers supply a bar to link the two together at the most suitable optical distance. The rest of the optical equipment was arrived at by trial and error, our aim being to produce an evenly focused image in a brightly illuminated field of constant diameter with all three objectives, without having to adjust the condenser or the illuminant. This has two advantages:

(1) Once the illumination is satisfactory and properly centred, the apparatus can be easily manipulated by persons not conversant with the niceties of substage condensing.

(2) The interval between the microscope stage and the illuminant can be enclosed by a metal hood, so avoiding glare when the instrument is used in the dark.

The apparatus is unsuitable for oil-immersion work, but with the combination given below magnifications of

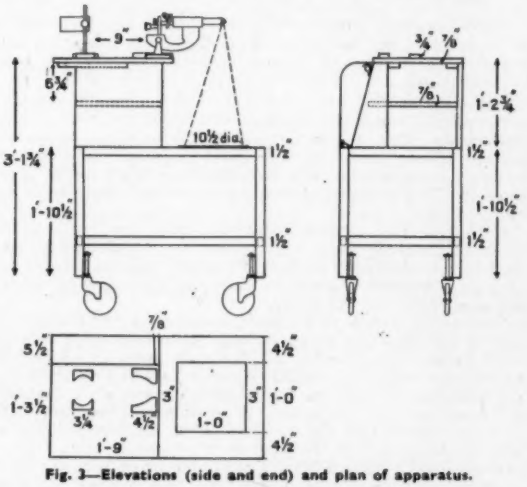


Fig. 3—Elevations (side and end) and plan of apparatus.

× 100, × 200, and × 400 are possible. The optical equipment is as follows:

Microscope, series 1000 M1806 high-power filament lamp with transformer 3 objectives—8 mm., 16 mm., and 25 mm. Prismatic attachment	Supplied by Cooke Troughton & Sims Ltd.
Ocular ×10 projection Condenser (aplanatic, wide-angle, with top lens removed)	Supplied by R. & J. Beck Ltd.

The screen itself is of plywood or 'Perspex' painted white. The metal viewing-box (fig. 4) was made by courtesy of Dr. C. H. Wilson of the department of physics, Westminster Medical School. The trolley (fig. 3), including the electrical work, was made to specification by Collimator Cases Ltd., and the trolley-wheels by G. H. Hughes Ltd., Birmingham. A shelf is incorporated, accessible from behind, to hold the transformer, unused flex, slide trays, &c. The cost of the complete optical equipment was approximately £90; the trolley cost £35.

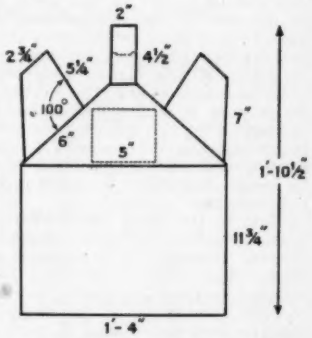


Fig. 4—Side elevation of viewing-box.

A. D. MORGAN
M.A., M.B. Aberd.
Head of morbid anatomy department, Westminster School of Medicine

H. A. SISSONS
M.B. Melb.
Medical officer, department of pathology, Royal National Orthopædic Hospital

Reviews of Books

A Manual of Paper Chromatography and Paper Electrophoresis

RICHARD J. BLOCK, department of biochemistry, New York Medical College; EMMETT L. DURRUM, chief, department of pharmacology, Army Medical Service Graduate School, Walter Reed Army Medical Center, Washington, D.C.; GUNTER ZWEIG, research biochemist, Charles F. Kettering Foundation, Yellow Springs, Ohio. New York and London: Academic Press. 1955. Pp. 484. $8.00.

THIS excellent book seems to cover all the important publications up to 1954 and it shows clearly the astonishing range of paper chromatography at the present time.

It begins with an adequate theoretical treatment, and the experimental technique is covered in sufficient detail. The treatment of the quantitative methods is more thorough than in any other book, though some of the methods are still claiming accuracies which it is very difficult to realise without long practice. The largest single section is devoted to amino-acids and peptides.

Carbohydrates, steroids, and bile-acids are very fully treated; and an enormous number of miscellaneous substances are also dealt with. The reader has no trouble in obtaining information about solvents and methods of revealing the compounds on the paper.

The second section of the book, on paper electrophoresis, is also well done, but perhaps it would have been more helpful if the author had expressed his own preferences for apparatus a little more definitely, because a number of variants of almost the same nature are given. Considerable attention is devoted to quantitative separations of serum-proteins, but the impression is left that this is still rather an empirical procedure and that although results may be reproducible, exact interpretation is a little uncertain. There is no doubt, however, that it gives a very fair impression of the value of the method at the present time.

Operative Cholangiographie

Technik, Diagnostik, Praxis. Dr. WALTER HESS, Oberarzt der chirurgischen Universitäts klinik, Basel. Stuttgart: Thieme. 1955. Pp. 201. DM. 42.

IN this monograph Dr. Walter Hess ably reviews the research which has led to current methods of cholangiography. His book is well produced and liberally illustrated with clear diagrams and many excellent radiographs. The methods and apparatus of Mallet-Guy and of Caroli are described, and Dr. Hess also gives an account of his own method which ingeniously combines both of these techniques. Drawings show the various radiological pictures obtained at differing perfusion pressures of the contrast solution. A section dealing with anæsthesia and the action of the more common drugs used in anæsthesia makes it clear that almost all of these alter the biliary pressure, and that ether anæsthesia without premedication is required. Unlike some workers he allows induction with thiopentone. Also he notes that ether in very deep anæsthesia will affect the pressure.

Most of the book deals with the diagnosis of biliary-tract disorders by means of manometric and cholangiographic findings at operation, and after operation by means of an indwelling T-tube. The cystic-duct syndrome, whether caused by congenital-valve formation, inflammatory thickening of the cystic duct, or spasm of the duct, is well described. Hypertonia of the biliary tract may be primary ("essential" hypertonia), or secondary to an obstruction. Both conditions lead to dilatation of the ducts and gall-bladder, and in many cases only manometry will distinguish between them. Hypotonia may be found in an anatomically normal duct in the presence of stones, which can give rise to false pressure readings if they become impacted. Dr. Hess mentions only in passing the association of cholangitis with hypotonia which is important, however, in relation to postcholecystectomy jaundice without stones in the common duct.

The most important part of the book is the large and well-written section on the surgery of the biliary tract under cholangiographic control. Dr. Hess remarks on the great frequency with which stones are left behind after operations on the biliary tract, and explains how misfortune can be almost completely abolished. Failure of cholecystectomy is so common that it deserves more space than he has given it: probably at least 30% of cholecystectomies are unsuccessful, and in nearly half of these the results are so bad that the patient welcomes the suggestion of another operation. If manometric and cholangiographic control are used, such failures should be very few.

The work is an admirable piece of research and exposition written in easily readable German.

Collected Papers of Otto Fenichel

Collected and edited by HANNA FENICHEL; DAVID RAPAPORT. London: Routledge & Kegan Paul. 1954. Pp. 408. 35*s*.

Fenichel was the author of two textbooks of psychoanalysis in which his expository gifts were manifest. So highly were these works esteemed that, as the introduction reminds us, the larger of them was compared by a prominent psycho-analyst to the Code of Justinian. In keeping with a book-making trend that is steadily evident, not only among psycho-analysts, Fenichel's shorter writings are now being republished, and the present volume contains those that appeared between 1922 and 1936. They are unselected, and range from notes, two or three paragraphs long, to detailed studies of such questions as the pre-Œdipal phase in girls and the pregenital antecedents of the Œdipus complex. The outstanding features of these papers is their close dependence upon observations made on individual patients in the course of psycho-analytical treatment. They are well translated and represent the main stream of orthodox Freudian thought.

Management of Acute Poliomyelitis

C. P. STOTT, S.R.N., diploma of poliomyelitis nursing; M. FISCHER-WILLIAMS, M.R.C.P.E., senior neurological registrar, Birmingham United Hospitals. Edinburgh and London: E. & S. Livingstone. 1955. Pp. 99. 12*s*. 6*d*.

THE principal author is a nurse and the book is therefore one for nurses, although the title hardly makes this clear. Nurses who have some practical experience of nursing poliomyelitis patients will find the book very helpful, especially in the management of respirator cases. The authors consider that the isolation of patients in the acute stage is still a debatable subject, and the chapter on isolation technique is not very convincing. The illustrations showing how patients should be handled and exercised are really helpful. The equipment required for a poliomyelitis unit is set out in an appendix.

Manson's Tropical Diseases (14th ed. London: Cassell. 1954. Pp. 1144. 60*s*.).—The new edition of this distinguished "manual of diseases of warm climates" is the eighth revision for which Sir Philip Manson-Bahr has been responsible, and it takes account of five years' progress. As Sir Philip says, most important among the advances is "the widespread application of the many so-called antibiotics to the treatment of tropical diseases, with gratifying results." More space has been given to the insecticides, which have done so much in recent years to combat tropical disease. That controversial condition, kwashiorkor, now has a chapter to itself, and so has epidemic hæmorrhagic fever, which Korean experiences brought to wider notice. To make room for these things, the chapters on diet and nutrition, the preliminary statement on virus diseases, and the historical sections in each chapter have had to be omitted.

General Aspects of Ageing.—Volume I in the Ciba Foundation Colloquia on Ageing reports the proceedings of the conference on this subject held last year at the foundation. Earlier in 1954 the trustees had decided to support basic research into the process of ageing, and it is hoped that this will be the first of a series of conferences. The editors of the volume are Dr. G. E. W. Wolstenholme and Miss Margaret Cameron. (London: J. & A. Churchill. 1955. Pp. 255. 30*s*.)

Neuropharmacology.—The Josiah Macy, jun., Foundation, New York, has published the transactions of the conference on this subject held in May, 1954. The editor is Dr. Harold A. Abramson. (1955. Pp. 210. $4.25.)

"...the least toxic of all the iron preparations"

Med. Press, 1954 (Feb. 3), p. 112

Clinical trials have shown that Anorvit, the new B.D.H. preparation of iron with vitamins C and K — provides most effective absorption of iron with remarkable freedom from gastro-intestinal disturbance.

'ANORVIT' TRADE MARK

Tablets containing:
ferrous sulphate, exsiccated, 3 grains (200 mg. approx.)
ascorbic acid 10 mg.
acetomenaphthone 2 mg.

DOSAGE
Children—1 tablet 2 or 3 times a day.
Adults—2 tablets 3 times a day.

Basic N.H.S. prices:
Bottles of 50 Tablets 1/10 and 500 Tablets 9/6

Detailed literature and specimen packings are available on request.

THE BRITISH DRUG HOUSES LTD. (Medical Department) LONDON, N.1
ANVT./B/541

When the worst is over

Skill and care have won the battle, and the exhausted body is recuperating. It is *then* that Burgoyne's Tintara may mean the difference between long, dragging convalescence and a rapid recovery. For Tintara is not only beneficial but a really palatable burgundy. It contains no added alcohol or sugar and is a natural product of sun and ironstone soil.

Burgoyne's
TINTARA
(FERRUGINOUS) PRODUCE OF AUSTRALIA

P. B. BURGOYNE & CO. LTD., DOWGATE HILL, LONDON, E.C.4. TEL: CITY 1616

A NEW ORGANON PRODUCT GIVING

Tranquillity without sedation

Quiescin

RESERPINE-ORGANON

QUIESCIN, an alkaloid of Rauwolfia serpentina, is of the greatest clinical value in the treatment of anxiety and tension states. Quiescin gives a feeling of relaxation and comfort, banishes depression, and lowers raised blood pressure.

INDICATIONS

Anxiety states
Mental illness
Hypertension

Quiescin

★ does not produce the mental dullness or addiction associated with barbiturates.

★ wide margin between therapeutic and toxic dosage.

★ no lowering of blood pressure in normotensives.

★ only mild, infrequent side-effects encountered.

Literature and clinical sample on request

DOSAGE
For mental illness and/or hypertension ½—3 mg. per day in divided doses as required. In anxiety states up to 1 mg. per day as necessary.

AVAILABILITY
Tablets of 0.1, 0.25 and 1 mg. in bottles of 25, 100 and 500.

ORGANON LABORATORIES LTD.

BRETTENHAM HOUSE • LANCASTER PLACE • LONDON • W.C.2

Telephone : TEMple Bar 6785/6/7, 0251/2 Telegrams : Menformon, Rand, London

26

THE LANCET

LONDON: SATURDAY, JULY 2, 1955

The Physician and Industrial Health

Dr. DONALD HUNTER has written a remarkable book which he has called *The Diseases of Occupations*.[1] But it is much more than that. Was it TALLEYRAND who said that "a good doctor should know a little about everything—even medicine"? Dr. HUNTER, who has a Baconian approach to facts and ideas, knows a great deal about everything, including occupational as well as general medicine. He deals not only with the clinical and curative aspects of occupational diseases but also with social history and politics, legislation, industrial processes, engineering, metallurgy, geology and climate, chemistry, toxicology, and accidents and their prevention. He takes a wide sweep of the occupations of the world, ranging from the occupations determined by climate, including those of the freebooters of the Asiatic Steppes, the nomads, and the people who live in the settled grasslands, to the Brandon flint-knappers, the red-pepper industry of Eastern Europe, the activities about abattoirs and sheep stations, and the handlers of parrots and fulmar petrels. The earnest critic could probably find occupations, such as those of barrow-boys and newspaper-sellers, which have not been caught in Dr. HUNTER's drag-net, but they would be very few. The well-known occupations and their health risks have been treated with impressive care and completeness. Inevitably, in a book with only one author, however knowledgeable, there are gaps; but the book is almost as comprehensive as it is fascinating.

This achievement is all the greater because Dr. HUNTER is a general physician who at first had no official connection with industry. In most countries the influence of occupation on health has been largely ignored by the general physician—an ostrich-like attitude which he suggests may be traced to the ancient Greeks' prejudice against manual labour and to the fact that the medical profession, in this scientific age, is still influenced by the classical tradition. SOCRATES held that

> "what are called the mechanical arts, carry a social stigma and are rightly dishonoured in our cities. For these arts damage the bodies of those who work at them or who have charge of them, by compelling the workers to a sedentary life and to an indoor life, by compelling them, indeed, in some cases to spend the whole day by the fire. This physical degeneration results in deterioration of the soul. Furthermore, the workers at these trades simply have not got the time to perform the offices of friendship or of citizenship. Consequently they are looked upon as bad friends and bad patriots. And in some cities, especially the war-like ones, it is not legal to ply a mechanical trade."

In an oration to the Royal Institution in 1941 Prof. BENJAMIN FARRINGTON discussed the implication of this attitude for the mechanical trades and the effect it had on ancient medical science and practice. In general, the working man was neglected in medical practice and the occupational diseases ignored in medical science. Dr. HUNTER points out that

> "historians have been very properly impressed with the comprehensive outlook of the ancient medical manual (Hippocrates, *Airs, Waters, Places*). But, if we look at it carefully, we can see that it is deficient, professing to be a treatise on environment and yet omitting what may be described as the most important element in the environment from the point of view of health and disease, the regular occupation of the man."

Since those days we have travelled far, but not so far as might be imagined; for, though the Industrial Revolution made England wealthy, it had some devastating consequences for the workers which are not yet by any means at an end. It is good to read, in Dr. HUNTER's early chapters, of the large part played in factory reform by those members of our profession who were exceptional in regarding the conditions of work as very much the concern of medicine. Notable among these was CHARLES TURNER THACKRAH, a physician in Leeds, who died at 37, but not before he had produced, in 1831, the definitive edition of his (the first) English textbook on the diseases of occupation.[2] Sir THOMAS LEGGE, himself a pioneer and the author of a notable textbook,[3] wrote:

> "I believe Thackrah's early death retarded the progress of industrial medicine and surgery and the amelioration of conditions of employment for half a century. Had he lived his clinical knowledge and experience would have given prominence in legislation to the need for medical supervision in the factories and workshops by practitioners having the necessary knowledge of home conditions of the workers and the maladies attributable to industrial life in its widest sense."

After THACKRAH's the next English textbook,[4] published in 1892, was by J. T. ARLIDGE, F.R.C.P., physician to the North Staffordshire Infirmary; and this too showed the value of first-hand experience. In the intervening years the two most distinguished contributors to industrial medicine were T. B. PEACOCK, of St. Thomas's Hospital, and E. H. GREENHOW, of the Middlesex Hospital. In the *Transactions* of the Pathological Society of London (1860–66) may be found excellent clinical and pathological descriptions by both these physicians of the disease which was to be called silicosis by VISCONTI in 1870. Another general physician who devoted much time and thought to the occupational diseases was Sir THOMAS OLIVER, of Newcastle upon Tyne, whose *Diseases of Occupation*,[5] first published in 1908, illustrates his lively mind and his interest in preventive medicine. And now Dr. HUNTER, of the London Hospital, will be numbered among this select band of general physicians who have gone into workplaces to see for themselves how men, women, and children work, and who have tried to prevent the diseases of occupation. The nation owes them and others more than it knows in terms of health and happiness of its members; but their work is not always dramatic and they have had an uphill fight. Even now, the diseases of occupation are rarely taught to undergraduates—the London Hospital is one of the exceptions in this respect—and postgraduate instruction on the subject is scanty and uncoördinated.

Dr. HUNTER's book is a powerful answer to those who maintain that industrial or occupational medicine

1. The Diseases of Occupations. By DONALD HUNTER, M.D., F.R.C.P., physician to the London Hospital. London: English Universities Press. 1955. Pp. 1046. £5 5s.

2. Thackrah, C. T. The Effects of Arts, Trades and Professions. Leeds, 1832.
3. Legge, T. Industrial Maladies. Oxford. 1934.
4. Arlidge, J. T. The Diseases of Occupations. London, 1892.
5. Oliver, T. Diseases of Occupation. London, 1908.

is a "narrow specialty," and also to the recently reported remark of the Chief Inspector of Factories [6] that "industrial health is not essentially a medical problem." Actually the impetus for improved conditions at work has come largely from doctors and will probably continue to do so; which makes it all the more regrettable that, administratively, industrial medicine in this country is divorced from the hospitals in the National Health Service. We agree with the editor of the *Transactions* of the Association of Industrial Medical Officers when he said that "industrial medicine has been bedevilled by ministerial jealousies. Let the patient take his rightful place in the forefront of all discussions and let him remain what he is, one whole and undivided person." Dr. HUNTER, in his fine book, has put a signpost on the right road.

Synthetic Analgesics

MORPHINE has well-known disadvantages—its use may lead to addiction, and it sometimes has undesirable side-effects—but it is still the standard analgesic against which all others are set. The euphoria produced by morphine, though it may result in addiction, probably contributes notably to its power to control pain; BEECHER [7] suggests that its value as an analgesic stems largely from modification of the response to pain. Other potent analgesics also cause euphoria, and none has yet been found that does not have this effect, and which therefore is free of the risk of addiction. With one exception drugs with powerful analgesic action—whether transformation products of morphine or synthetic compounds—have several structural features in common. The exception is the dithienyl-butanes; but these are also addictive.[8] Broadly speaking, analgesic potency seems to match the risk of addiction, though there is some evidence that methyl-dihydromorphinone (metopon) hydrochloride has slightly less strong habit-forming properties than morphine itself.[9]

The main side-effects of morphine are nausea, vomiting, constipation, sweating, and respiratory depression; and the intellectual dulling associated with protracted administration may also be included among the disadvantages. The common synthetic analgesics, such as pethidine, amidone, and methorphinan, are said to have side-effects less commonly and in slighter degree. Controlled trials suggest that, given in equivalent analgesic doses, they are all about equally liable to produce side-effects [10]; a few patients tolerate none of them, but in others the response varies widely so that the drug of choice differs from one patient to another. With either morphine or a synthetic analgesic both effectiveness and side-effects may depend on the method of administration. Morphine is relatively ineffective when given by mouth; the analgesia from gr. $^1/_6$ orally is less than that from gr. 10 of aspirin.[11] All the synthetic analgesics can be administered either orally or parenterally; but oral administration of pethidine and, particularly, of amidone is likely to cause nausea and vomiting, so the resulting analgesia is variable. Methorphinan, on the other hand, is well tolerated and effective when given by mouth; and since its action is long-lasting it is useful in the treatment of chronic pain—though for this purpose parenteral amidone may be preferable, since it has a slighter central effect.

A new synthetic analgesic has now been developed from pethidine. This is 1,3-dimethyl-4-phenyl-4-propionoxy-piperidine ('Nisentil'). Clinical trial of this drug in the control of postoperative pain suggests that it is an effective analgesic of short duration, with little hypnotic or other side-effect.[12] Nevertheless this, too, is apparently a drug of addiction,[13] and absence of central sedation in the postoperative period may not be an advantage. Much attention is also being given to increasing the usefulness of morphine and its derivatives by preventing side-effects. Chlorpromazine, it has been found, substantially reduces nausea and vomiting. Replacement of the N-methyl by an N-allyl group in the morphine molecule has yielded allylnormorphine ('Nalorphine') which effectively prevents respiratory depression due to morphine or related analogues. The compound resulting from a similar substitution in methorphinan has much the same action.[14] These antidotes have not proved wholly satisfactory, since they themselves may have undesirable actions. Perhaps diamino-phenylthiazole may prove free from this drawback. This agent has a distinct and long-lasting antagonism to respiratory depression due to morphine, but in therapeutic dosage does not affect analgesia.[15]

Artificial Pneumothorax

ARTIFICAL pneumothorax (A.P.) is not fashionable. It has been used considerably less in the past few years; but we do not know how much less. Some physicians do not use it at all; others deplore its downfall, but induce few A.P.s. No doubt some continue to treat many patients with it, and would stoutly defend their methods against the arguments of those who prefer lengthy treatment with antibacterial drugs and pulmonary ablation. Possibly the majority prefer to wait and see; for at present there are hardly enough facts on which to form a judgment. This question will be settled, not by a definitive controlled trial, but by the slow evolution of medical opinion, influenced more by personal observation than by published statistics.

It is surprising to find so much still being written about pneumothorax treatment. The number of papers on the subject published throughout the world fell from 250 in 1938 to 100 in 1947; but the number remains the same in the Current List for 1954. Certainly not all of them were condemnatory. The published long-term results have not been discouraging; and they were obtained with little help from the antibacterial drugs. The valuable survey from Frimley Sanatorium,[16] for instance, showed clearly that the more modern methods of treatment would have to be very good indeed to beat the pneumothorax if only survival and working capacity were

6. *Times*, May 17, 1955.
7. Beecher, H. K. *Anesthesiology*, 1951, **12**, 633.
8. May, E. L. *Amer. J. Med.* 1955, **14**, 540.
9. Lee, L. E. *J. Pharmacol.* 1942, **75**, 161.
10. Nathan, P. W. *Brit. med. J.* 1952, ii, 903.
11. Beecher, H. K., Keats, A. S., Mosteller, F., Lasagna, L. *J. Pharmacol.* 1953, **109**, 393.
12. Bachrach, E. H., Godholm, A. N., Betcher. A. M. *Surgery*, 1955, **37**, 440.
13. Isbell, H. *J. Pharmacol.* 1949, **97**, 182.
14. Cullen, S. C., Santos, C. C. *Arch. Surg., Chicago*, 1954, **69**, 410.
15. Shaw, F. H., Shulman, A. *Brit. med. J.* 1955, i, 1367.
16. Foster-Carter, A. F., Myers, M., Goddard, D. L. H., Young, F. H., Benjamin, B. *Brompton Hosp. Rep.* 1952, **21**, 1. See *Lancet*, 1953, i, 486.

considered. ROBERTS and LYONS[17] have recently reported similar results in nearly 400 patients treated between 1942 and 1948. 91% of 304 who left hospital with an A.P. on one side survived for five years; and 77% of 88 lived for ten years. Of 43 with disease confined to one lung-zone only 2 died during the first five years; and four-fifths of those with four and more zones involved survived for the same period. It would be unwise to assess the value of the treatment only from such measurable factors. Possibly for certain types of disease the survival-rates and working capacity after pneumothorax are identical with those after other treatments. A rational conclusion might then be reached by considering such matters as length of stay in hospital, the effects of the treatment on the patient's mind, and the functional result. But the judgment may not in the end be rational. Treatment by artificial pneumothorax is declining so rapidly that it may soon become difficult to gain adequate technical experience of it; and chest physicians without such experience are unlikely to induce a pneumothorax that they cannot confidently maintain. The treatment may then die out, not because there is a better way, but because there are easier ways, of treating pulmonary tuberculosis.

It would be a pity to let such a well-tried treatment die through technical neglect, while there is still doubt whether it should die at all.

Annotations

THE I. R. U.

WHEN a patient has been discharged from hospital as "fit," or told by his doctor that he can now return to work, his gravest medical difficulties may be only just beginning, and he is liable to be left to cope with them alone—with the unfortunate results so well portrayed in the study of Glasgow ex-patients by Ferguson and McPhail.[18] An official effort to prevent the social disasters caused by residual handicaps began in 1943 when a residential industrial rehabilitation unit was set up at Egham, on the recommendation of the Tomlinson report.[19] The scheme was expanded after the reorganisation of the Ministry of Labour and National Service in 1948, using experience gained in the reablement of ex-Servicemen and returned civilian prisoners-of-war. Today there are 14 industrial rehabilitation units in Britain, together with a research and development unit at Waddon. Each centre has its doctor, social worker, disablement rehabilitation officer, and industrial psychologist or vocational officer, and can take 50–100 persons staying for an average of eight weeks. Originally the aim was solely physical reconditioning—with fresh air, good food, physical training, and recreation—but it was soon realised that mental toning-up was equally important, to restore lost confidence and combat deterioration caused by enforced idleness. Selection of applicants follows a medical examination whose object is to determine whether the applicant will be fit, at the end of the course, for placement in industry or for entry to a vocational training centre. A "straight" medical or orthopædic case, recommended by a hospital or surgeon is usually accepted more readily than a patient with epilepsy or a neurosis or psychosis, for whom success is less probable.

Since their inauguration these units have dealt with 60,000 men and women, and a sample of 7000 has now been specially studied.[20] The results are encouraging; for five-sixths completed the reablement course successfully and were either placed in employment or admitted to a training course. A follow-up six months later showed that four-fifths of those placed in employment had been successfully settled. The sample investigated showed particularly satisfactory results in the large group of tuberculous patients, of whom a proportion more than twice the average were admitted to training. Amputations did not bear out the expectation of having a better-than-average reablement prospect: in fact they were not so easily placed in employment as the average patient. The results for injuries also proved rather surprising, the success of immediate placing being better with injuries of the upper limb compared with the lower, though the success at follow-up showed less difference. In about two-thirds of those abandoning the course failure to complete it was due to medical reasons: premature termination was twice the average in psychosis (33%), the next highest rates being for mental deficiency (23%) and diseases of the skin (22%). About a fifth of those completing the course were passed on to vocational training centres. The least successful results in placement were obtained with epileptics and patients with nervous and psychological disorders, though the criteria for their admission to the course had been more severe. Epileptics had good initial placement results, but after six months they were at the bottom of the list with less than 60% of those placed in employment still at work. It is therefore suggested that more searching tests may have to be imposed for epileptics and patients with nervous disorders before they are admitted to expensive training courses. Though it is known that the average age in the sample was 37 years, and that 17% were over 50 years of age, the results are not analysed, in the published summary, according to age and length of prior employment. Judging by the follow-up results, elderly long-unemployed workers were (as would be expected) less suitable for training, and the group with diseases associated with later years—respiratory and cardiovascular disorders and arthritis—had equally low proportions suitable for training. But their final success in retaining a job was up to the average.

Resentment is sometimes felt, especially by the young,[21] because training is not automatically offered when disability is obvious. But a cardinal principle of industrial training laid down in the Tomlinson report[19] was that training shall be provided only if it is necessary in order to obtain employment, and only if it is likely to overcome the handicap. Disability by itself is no claim to a course of training.

TRACE ELEMENTS

THE requirement by man and animals of so-called trace elements is a fine example of the integration of metabolism with available resources. Primitive societies, even if they had been equipped to do so, need not have worried that they were not getting enough of these elements. The low fluorine content of the water, and the consequently high dental-caries rate, in some areas might seem to show Nature failing to live up to its promise; but, though increasing the fluorine content will reduce the incidence of caries, there is reason to believe that this would never have been high but for our artificial way of life.

At a recent symposium in the Vatican City, human, animal, and plant physiologists met to share their knowledge of these elements. All the mammalia require copper, cobalt, and zinc; and they probably combine these into several similar compounds and utilise them on the same enzymic systems—for example, carbonic

17. Roberts, B., Lyons, J. P. *Tubercle*, 1955, **36**, 187.
18. Ferguson, T., McPhail, A. N. Hospital and Community. London, 1954.
19. Report of Interdepartmental Committee on the Rehabilitation and Resettlement of Disabled Persons. Cmd. 6415, 1943.
20. *Minist. Lab. Gaz.* 1955, **63**, 121.
21. Ferguson, T., McPhail, A. N., McVean, M. I. Employment Problems of Disabled Youth in Glasgow. Medical Research Council Memorandum no. 28, 1952.

anhydrase[1] or butyryl coenzyme A dehydrogenase.[2] Likewise, it is fairly certain that molybdenum will turn out to be an important part of the xanthine oxidase system in man, as it has proved to be of that in rats.[3,4]

At the Vatican City meeting, Prof. R. A. McCance, F.R.S., considered several elements of medical interest. Discussing the association of Kinnier Wilson's disease with disordered copper metabolism,[5] he said that this disease, as we see it today, may be described as follows:

There is a deficiency of coeruloplasmin (a specific protein to which over 90% of the copper in the serum is normally bound firmly), which may be the hereditary lesion; and owing to it, or for some reason connected with it,[6] excessive amounts of copper are absorbed. This has been checked by the use of radioactive copper.[7] The metal does not remain in the plasma. Much of it is excreted in the urine, and the rest seems to pass into the cerebrospinal fluid and tissues where it is deposited in progressive and ultimately destructive amounts. The brain and liver are the first to suffer; whereas the heart, lungs, erythrocytes, and skeletal muscle remain relatively clear. The separation of the metal in the eye tissue is the cause of the Kayser-Fleischer rings. The deposition of copper in the kidney may interfere with the reabsorptive mechanism for amino-acids, or possibly the amino-acids pass through the glomerulus combined with copper in a chelated form, and these compounds are not susceptible to reabsorption. Copper is also excreted in combination with peptides.[8]

The administration of amino-acids by mouth increases the excretion of copper in patients with Kinnier Wilson's disease, but not it seems in normal people—or at least not to any great extent.[9] There are many puzzling features about the metabolism and excretion of amino-acids by these patients. Their pattern and concentration in the plasma seem to be normal, whereas the excretion is high and very variable. Histidine, serine, tyrosine, and threonine may predominate, but proline and citrulline have been emphasised by other investigators. The amounts excreted seem to depend on the dietary proteins and the state of the disease rather than on the liver lesion.[10] It is difficult, as Professor McCance remarked, to understand the observation by Cooper et al.[11] that unlimited protein food and even the infusion of amino-acids did not increase the loss.

Turning to mercury, Professor McCance remarked that pink disease (acrodynia) has been ascribed to poisoning with this element,[12] but that in treatment dimercaprol has not fulfilled its earlier promise.[13] It now seems that some of the symptoms and signs may be due to mercury, but that they are essentially manifestations of gross overactivity of the sympathetic system, and yield satisfactorily to administration of tolazoline.[14,15]

"Where then does the mercury come in? . . . If, for example, the symptoms and signs are due to sympathetic overactivity and relieved by drugs which are lytic for this system and stimulate the parasympathetic side, why do the patients stop sweating after the administration of the drug? If mercury is implicated, why was the disease not more common when mercury was much more of a therapeutic standby than it is today? . . . Have the patients who get pink disease absorbed more mercury than others who have been treated in a similar way, or deposited it in some abnormal site? Are they suffering from something analogous to Wilson's disease? It has been suggested that these patients have been 'sensitised' by the mercury or were peculiarly 'sensitive' to mercury[16]; but these phrases have no exact meaning, and patch tests with calomel or mercury have not proved a help.[17]"

1. Berfenstam, R. *Acta pædiat., Stockh.* 1952, **41**, 32.
2. Mahler, H. R. *J. biol. Chem.* 1954, **206**, 13.
3. Mahler, H. R., Mackler, B., Green, D. E., Bock, R. M. *Ibid*, 1954, **210**, 465.
4. Mackler, B., Mahler, H. R., Green, D. E. *Ibid*, p. 149.
5. See *Lancet*, 1951, i, 1404; *Ibid*, 1952, i, 199; *Ibid*, 1952, ii, 325.
6. Earl, C. J., Moulton, M. J., Selverstone, B. *Amer. J. Med.* 1954, **17**, 205.
7. Matthews, W. B. *J. Neurol. Psychiat.* 1954, **17**, 242.
8. Uzman, L. L. *Amer. J. med. Sci.* 1953, **226**, 645.
9. Matthews, W. B., Milne, M. D., Bell, M. *Quart. J. Med.* 1952, **21**, 425.
10. Cartwright, G. E., Hodges, R. E., Gubler, C. J., Mahoney, J. P., Daum, K., Wintrobe, M. M., Bean, W. B. *J. clin. Invest.* 1954, **33**, 1487.
11. Cooper, A. M., Eckhardt, R. A., Falcoon, W. W., Davidson, C. S. *Ibid*, 1950, **29**, 265.
12. See *Lancet*, 1951, i, 1216.
13. Southby, R. *Med. J. Aust.* 1953, ii, 420.
14. Peterson, J. C., Laughmiller, R. *Acta pædiat., Stockh.* 1954, **43**, 517.
15. See *Pediatrics*, 1955, **15**, 202.
16. Fanconi, G., Botsztejn, A. *Helv. pædiat. acta*, 1948, **3**, 264.
17. Holzel, A., James, T. *Lancet*, 1952, i, 441.
18. *Ibid*, 1955, i, 1270.
19. *New York Times*, June 9, 1955.
20. *Ibid*, June 10, 1955.
21. See *Lancet*, 1955, i, 851.
22. *New York Times*, June 26, 1955.

CONTROL OF POLIOMYELITIS VACCINE

In the detailed report on the Salk poliomyelitis vaccine which we recently summarised,[18] the Surgeon-General of the United States Public Health Service described some of the procedures which are to be adopted for the biological control of the vaccine. The manufacture of the vaccine on a large scale has shown that the process of inactivating virus by formaldehyde does not always follow the original concept laid down by Dr. Salk.[19] The original safety tests were designed "primarily to demonstrate mass contamination resulting from accidents in manufacture, and not small amounts of residual live virus which the process was believed to reduce to an immeasurably low and harmless level." We may infer from this that the curve describing the inactivation of poliomyelitis virus by formaldehyde is not strictly linear, but follows a less readily predictable course. In consequence, it has been found necessary to increase the minimum requirements for vaccine testing to provide a substantially greater margin of safety.[20] These changes provide for an increase in the number and sensitivity of the tests, and the application of the tests at more critical points in the manufacturing process. In addition, a final tissue-culture test of the finished product has been added to exclude virus contamination during the bottling process. The revised requirements will be incorporated in official regulations to establish their status as mandatory standards. There is also to be a considerable expansion in the organisation for controlling the requirements for vaccine production, including the creation of a technical committee on poliomyelitis vaccine, a new Division of Biological Standards, and increased "on-plant" surveillance and consultation by Public Health Service staff and by consultants drawn largely from university research centres.

These, and other similar measures, are sensible second thoughts which will increase the safety of the vaccine considerably. But there is a danger that in navigating the narrow channel of formaldehyde treatment, manufacturers, anxious to keep clear of the Scylla of incompletely inactivated virus, may founder on the Charybdis of insufficiently potent vaccine. There are fears too that the decision to stop controlled trials of the vaccine will have obscured the navigational markings in this particular danger spot; it will be no easy matter in present circumstances to get a clear idea of the efficacy of different batches of vaccine in preventing paralytic poliomyelitis. The report on the 1954 vaccine trial[21] made it clear that batches of vaccine prepared by different manufacturers from the same formula showed considerable variations in their immunising potency, and this finding should not be overlooked in the natural anxiety to ensure that the vaccine is as safe as is humanly possible. This consideration becomes all the more important as changes are introduced here and there into the technique of vaccine production.

In Washington last week a panel of 15 experts discussed the situation.[22] 8 were in favour of continuing the vaccination programme, 5 were opposed to it, and 2 abstained from voting. It seems, therefore, that vaccination on a large scale may begin again presently; but no vaccine will be released until it has passed the new safety tests. It has not yet been announced who will get the vaccine and when.

MENTAL DISORDERS DUE TO CORTICOTROPHIN AND CORTISONE

MENTAL disturbances are not uncommonly associated with disorders of suprarenal function. The apathy of patients with Addison's disease is well known; mental disturbance is found in many patients with Cushing's syndrome [1 2]; and patients with adrenal virilism may show schizoid reactions or have depressive episodes.[3–6] Thus it is not surprising that mental disturbances arise in patients treated with corticotrophin or cortisone [7–11]; but the cause of these aberrations remains in doubt. Lewis and Fleminger [12] find no evidence that patients who have been mentally ill are especially liable to such aberrations. Quarton et al.[13] consider whether corticotrophin and cortisone in some way directly damage nerve-cells. Cerebral lesions have been described in Cushing's syndrome [13] and in animals which have received large doses of corticotrophin or cortisone,[14] but in this experimental work the dosage was much higher than that used therapeutically. Other workers have reported cerebral vascular lesions after deoxycortone therapy,[15 16] and Selye [15] believes that these can result from administering corticotrophin or cortisone. It has also been suggested that multiple small cerebral thromboses may be responsible for mental abnormalities during treatment with these substances, since there is some evidence that the blood of such patients shows increased coagulability.[17]

There is at present no evidence that pituitary and adrenocortical hormones can pass the blood-brain barrier and directly affect the metabolism of the brain—though in disease the barrier might possibly become abnormally permeable to them. There is a certain amount of evidence that the hormones affect the permeability of the barrier to other substances [18]; and patients with Cushing's syndrome occasionally have elevated protein levels in the cerebrospinal fluid,[2] suggesting altered permeability. Electro-encephalographic studies in animals have yielded abnormal tracings which have been interpreted as indicating an antagonistic action between cortisone and deoxycortone on brain excitability; but the evidence is conflicting. Similarly it is impossible to draw any conclusions from the large mass of experimental work on the effect of cortisone and corticotrophin on the enzyme systems in the brain. Nor is there any evidence to support the idea that psychotic symptoms may arise from an unbalanced secretion of adrenocortical hormones in response to corticotrophin, or from the balance being disturbed by exogenous cortisone.

A more promising line has been followed by Mirsky [19] in work on conditioned behaviour in monkeys. He found that monkeys treated with corticotrophin were more exploratory in their behaviour and reacted more aggressively to unpleasant conditioning. Furthermore the treated animals forgot how to avoid an unpleasant situation more rapidly than an untreated control group. These aberrations of behaviour are not unlike the "denial" in manic patients. It may be significant that hypomanic symptoms have often been described in patients treated with corticotrophin or cortisone. Another possibility is that patients treated with corticotrophin or cortisone may develop a distorted relationship to themselves, and, especially when treatment has been pressed to the point of obvious physical change, the alteration of their body-image may precipitate mental upset. This conception has been developed in connection with schizophrenia by Macalpine and Hunter,[20] and could undoubtedly explain the mental aberrations in patients with adrenal virilism.[3–6]

THE BLOOD-BRAIN BARRIER

MANY years ago German workers drew attention to the difference in permeability between cerebral and other blood-vessels. In the normal animal the large-molecule dyes accepted by the histiocytes of liver and spleen and lymph-nodes did not appear in the histiocytes of the brain, except where the brain was injured or inflamed. This observation gave rise to the conception of the blood-brain barrier. Friedemann and Elkeles [21] studied the passage of toxins into the brain through this barrier and showed that factors other than molecular size were concerned—notably the charge and the lipoid solubility. King [22] suggested that a factor beyond the vessel wall—namely, tissue affinity—was involved.

The site of the barrier remained obscure. It might be the walls of the capillaries, though there was no visible structural difference between those of the brain and elsewhere; or it might be the accepting histiocytes, though in view of their activity in phagocytosis once inflammation had occurred this seemed improbable; or it could lie in the intervening ground-substance. Hess [23] points out the correlation in time and place between the barrier and the presence of a polysaccharide or glycoprotein in the interstitial tissue. In the mouse embryo this substance, assessed histochemically by the periodic acid-Schiff reaction, is absent, and there is no barrier; in the guineapig embryo the material is present, and so is the barrier. Further, after injury to the rat brain the area in which the barrier is absent is temporarily free of glycoprotein, and as healing occurs and the structure of the brain reverts to normal the glycoprotein and the barrier return pari passu. It seems probable that a gel with a carbohydrate background is formed in the ground-substance, but Hess has not yet completed the histochemical identification of the material. His work will be of great interest to neuropathologists and others concerned with the transport of viruses and large molecules to the brain and their dissemination in the cerebral tissue.

Elkeles [24] has lately shown the importance of electrical charge and lipoid solubility in the intravital staining of the adrenal cortex and medulla. Both the brain and the adrenal cortex, rich in lipoid, concentrated neutral-red chloride (a basic dye) from blood-levels which did not colour the rest of the body; whereas acid dyes were taken up by the rest of the body (including the adrenal medulla) but not by the brain or adrenal cortex.

1. Schlesinger, N. S., Horwitz, W. A. *Amer. J. Psychiat.* 1940, **96**, 1213.
2. Trethowan, W. H., Cobb, S. *Arch. Neurol. Psychiat.* 1952, **67**, 283.
3. Broster, L. R., Allen, C. E., Vines, H. W. C., Patterson, J., Greenwood, A. W., Marrian, G. F., Butler, G. C. The Adrenal Cortex and Intersexuality. London, 1938.
4. Allen, C., Broster, L. R., Vines, H. W. C., Patterson, J., Greenwood, A. W., Marrian, G. F., Butler, G. C. *Brit. med. J.* 1939, i, 1220.
5. Allen, C., Broster, L. R. *Ibid*, 1945, i, 696.
6. Greene, R., Paterson, A. S., Pile, G. C. L. *Ibid*, p. 698.
7. Thorn, G. W., Forsham, P. H., Frawley, T. F., Wilson, D. L., Renold, A. E., Frederickson, D. S., Jenkins, D. *Amer. J. Med.* 1951, **10**, 595.
8. Cleghorn, R. A., Pattee, C. J. *J. clin. Endocrin.* 1954, **14**, 344.
9. Clark, L. D., Bauer, W., Cobb, S. *New Engl. J. Med.* 1952, **246**, 204.
10. Margolis, H. M., Caplan, P. S. *J. Amer. med. Ass.* 1951, **145**, 382.
11. Goolker, P., Schein, J. *Psychosom. Med.* 1953, **15**, 589.
12. Lewis, A., Fleminger, J. J. *Lancet*, 1954, i, 383.
13. Quarton, G. C., Clark, L. D., Cobb, S., Bauer, W. *Medicine, Baltimore*, 1955, **35**, 13.
14. Castor, C. W., Baker, B. L., Ingle, D. J., Li, G. H. *Proc. Soc. exp. Biol., N.Y.* 1951, **76**, 353.
15. Selye, H. Stress Acta. Montreal, 1950.
16. Masson, G. M. C., Hazard, J. B., Corcoran, A. C., Page, I. H. *Arch. Path. (Lab. Med.)*, 1950, **49**, 641.
17. Cosgriff, S. W. *J. Amer. med. Ass.* 1951, **147**, 924.
18. Grenell, R. G., McCawley, E. L. *J. Neurosurg.* 1947, **4**, 508.
19. Mirsky, A. Proceedings of the Third A.C.T.H. Conference. Chicago.
20. Macalpine, I., Hunter, R. A. *In* Memoirs of My Nervous Illness, by D. P. Schreber. London, 1955.
21. Friedemann, U., Elkeles, A. *Lancet*, 1934, i, 719.
22. King, L. S. *Arch. Neurol. Psychiat.* 1939, **41**, 51.
23. Hess, A. *Nature, Lond.* 1955, **175**, 387.
24. Elkeles, A. *Lancet*, 1954, ii, 1153.

Special Articles

IF I WERE A MINISTER OF HEALTH IN ASIA

S. M. KEENY

DIRECTOR, ASIA REGIONAL OFFICE, UNITED NATIONS CHILDREN'S FUND

IN the last ten years a wholly new public-health situation has arisen in Asia. It is a situation brought about by modern medical techniques, which can tackle widespread disease at comparatively small cost, and by the availability of money from abroad to help put these techniques into action.

This combination of new money and new techniques is making it feasible for even poor countries to bring under control in a few years public-health enemies which have handicapped people for centuries. With supplies contributed since 1950 by the United Nations Children's Fund (UNICEF), for example, Indonesia has treated some 1,000,000 people for yaws, and it expects to bring this age-old threat under control within a comparatively few years.

GETTING ACQUAINTED

The new situation, however, has also made for impatience on the part of many Western administrators sent to the East and on the part of the officials of national health departments. From the point of view of the former, one needs to remember that they must report to political boards and committees of laymen. These, in turn, must show results to their constituencies, who expect every dollar abroad to do the work of ten or a hundred at home—especially where "miracle drugs" are concerned.

The problem of the public-health officer in Asia stems from the fact that aid is coming from many sources—perhaps the U.S. Foreign Operations Administration, the British Colombo Plan, or United Nations agencies such as the World Health Organisation, the Food and Agriculture Organisation, or UNICEF—and each has its own "mysterious" set of conditions. One could understand the attitude of such an official if he occasionally felt that the cure is sometimes worse than the disease.

The representatives of the foreign agencies and of the governments in Asia are just beginning to get acquainted. In the process, a lot of misunderstandings are gradually being cleared away. From my own contacts with about a dozen health ministries and conversations with representatives of UNICEF and other agencies, I have found that the following impressions—usually first impressions and wrong ones—need to be ironed out.

Foreign representatives sometimes feel that official public-health departments are casual in meeting deadlines, are slow in starting urgent programmes even after the requested supplies have arrived, and are sometimes reluctant to adopt new and cheaper methods that are sharply different from traditional practice—that, in countries where most of the people live in villages, health officials have too often thought first about their cities, particularly their capitals.

THE EYES OF ASIA

On the other hand, health officials in Asia have occasionally confided something about how we foreigners look to them. In their darker moments they seem to think of us as greedy for quick results, wanting long-term commitments from the Asian government against short-term commitments from ourselves, and inconsistent, with proposals varying from year to year according not only to the availability of funds but to changes of political temper in our own countries.

We rely too much, they sometimes feel, on our own imported personnel, who have been slow in arriving, who know next to nothing about the country to which they are coming or even of life in the tropics, and who too often go away just about the time they have begun to learn.

Foreign officials, too, they say, may tend to assume that local officials understand without explanation what is required from them by the contributing agency. We may be insensitive to the language difficulty often faced by the local official who speaks English imperfectly, if at all, although we seldom understand or seriously undertake to learn the local language. Finally, we may be unrealistic in asking for the immediate assignment of non-existent trained personnel and unaware of the difficulties of getting skilled staff to live in the rural villages.

CONSOLIDATING THE GAINS

Happily, by 1955, mutual understanding has advanced a long way from the melancholy picture I have just sketched. The practical question now is how a national health department can, in spite of difficulties which do exist, make use of the new opportunity to speed up the fight against disease and how to consolidate these gains into improved public-health programmes—particularly those that will better the health of the rural population.

If I were a minister of health, I should tackle the situation somewhat as follows:

1. I should start with the assumption, with which most people will agree, that the public-health budgets of most Asian governments are too small, even in comparison with the limited incomes of the governments, and that the best way to increase them is to show the sceptics in the finance department that the combination of foreign aid and new techniques, plus a relatively small amount of local money, make it good business to get rid of some of the diseases, such as malaria and yaws, that can now be prevented or cured so cheaply. The familiar phrase "Poor countries cannot afford the luxury of malaria" applies now to other diseases as well.

In a section of the Himalayan foothills in India, tens of thousands of acres of fertile land were reclaimed from the jungle when malaria was brought under control. Food production rose 50% after spraying was carried out with D.D.T. provided by the Children's Fund, and new farms were staked out by settlers moving in from crowded areas. Throughout Asia today, productivity is rising as men are being freed from the burden of sickness and disease.

2. I should ask the foreign agencies to state their policies clearly and to tell me about how much money I might reasonably expect for the next three years.

3. I should get some of the money I need by postponing expensive building campaigns. Good services depend less on buildings than on trained personnel and the right tools for them to work with.

4. With the assistance of the best specialists I could get from my own government, from the World Health Organisation, or the bilateral agencies, I should make up a ten-year plan as to what seems feasible. I should summarise it in a pamphlet that I would put into the hands of everybody who is likely to have anything to do with getting the money for the plan or making it operate. Within this broad plan, I should indicate more precisely what seems practical for the next five years, and I should try to persuade my government to make the plan firm for not less than three.

5. Within the larger plan, I should establish priorities determined both by the urgent needs of my country and by the size of the available help that is needed to get the job done—whether that help be in new drugs or in personnel. I should give priority in time to programmes for which aid is readily available. This is as good a priority as any, except for the musts such as plague or smallpox. When in doubt, I should begin with programmes that promised to save the most lives or cure the most people for the least money.

This coincides with the aim of most foreign agencies. Limited in the funds at their disposal, they wish to spend them in such a way as to help combat the most urgent problems of the greatest number of people. UNICEF, for example, whose function is to contribute certain imported supplies to help better the health of children, has devoted

most of its resources to fighting tuberculosis, malaria, and yaws by providing vaccines, insecticides, and penicillin; malnutrition by supplying medical supplies and teaching materials to equip and staff rural health centres. These activities, under way today in 88 countries from Asia and Africa to Latin America, are all designed to stretch limited funds as far as possible and to initiate self-help programmes which are supported largely out of local resources.

6. I should develop an active campaign to serve the villages, making it an honour for the staff to be assigned to rural areas, especially if they are difficult. I should adjust their wages and allowances to make life tolerable for them.

7. I should not start too many programmes at the same time, particularly those that will cost my government a lot about the same time if they are successful.

8. I should put the best man I could find on liaison work with the foreign agencies and have him learn all about their funny ideas and how to deal with them.

9. I should humour the foreigner by keeping his deadlines promptly and use my performance to get the same kind of action from him.

10. I should pay special attention to the bottlenecks—the points where prompt action on small things will have large results. I should make sure that I had enough trouble-shooters to see, for example, that imported supplies move quickly through Customs, and are delivered, assembled, and put to work promptly. Also, as soon as they were working, I would tell the agencies.

11. I should insist that no official in my department leaves his desk without giving his deputy authority to act in his absence.

12. Where doctors are scarce—which is nearly everywhere in Asia—I should study carefully the possibility of using technicians instead. I would assign doctors only to top supervisory and planning jobs and even there only if the job really requires a medical background.

I should try to encourage the training of home visitors, sanitarians, and other paramedical personnel. I should encourage basic training for unskilled practising village midwives, training now under way in a number of Asian countries with Children's Fund aid. As Indonesia is doing in the UNICEF-aided yaws campaign, I should give short training in case-finding to young men from the villages, to cut the numbers of doctors or other skilled personnel needed to carry out country-wide disease-control campaigns.

13. I should take care to strengthen my supervisory staff to keep pace with the expansion of new programmes.

14. I should look ahead as to the number of trained personnel that I must have, including technicians as well as doctors, and get them trained in time. I should make sure that the men who get special training are kept and used for the purpose for which they were trained.

15. I should arrange with my colleagues in education to speed up health education in schools, adult classes, and, through press and radio, to prepare the way for new programmes.

16. Where a new programme requires new skills, I should arrange refresher courses for all field workers who are going to be asked to use new methods.

17. I should make sure that the supplies I get from abroad are well used and that machines are not put into a back room when a part breaks.

18. I should develop indices of progress both for my own guidance and to help foreign agencies explain to the taxpayers of their countries that they are really getting value for their money.

19. I should refuse aid for schemes that are too expensive for my country, even though it is readily available and is attractive to some of my specialists. In particular, I should look with suspicion on elaborate X-ray equipment for mass work, on expensive mobile field units if my country does not have roads on which they can move readily, and on transport for which I could not provide the petrol and spares to keep them running efficiently.

20. I should not press for aid to local plants to manufacture highly complicated drugs or chemicals until I was sure I had both competent technical staff available, a certain source of the necessary components, and the prospect of reasonable production costs. I should go warily even then in fields where new discoveries are being made every year, necessitating rapid technical changes.

A QUOTA OF MISTAKES

To one acquainted with the world of shirt-sleeve diplomacy, some of the proposals I have made may seem far too risky. To this I would say that we are talking about big problems and that people who tackle them must take big risks and should be allowed a quota of fairly big mistakes. Moreover, people are ready to forgive a few mistakes by a man who really accomplishes something. Fiorella La Guardia was a great mayor of New York primarily because he fought for efficiency, against corruption, and always for the little man who is in the majority everywhere. But he was beloved of the people perhaps as much as for anything else for his classic candid admission, "When I make a mistake, it's a beauty."

It may well be that, if I were a minister of health in Asia and took my own advice, I should not be minister for long. But I doubt that I should be fired for doing the things I have suggested. There is no defence like results.

BOARDS OF GOVERNORS OF TEACHING HOSPITALS AND REGIONAL HOSPITAL BOARDS

THE following doctors have been appointed to boards. They will hold office till March 31, 1958. New appointments are indicated with an asterisk.

MEMBERS OF BOARDS OF GOVERNORS

United Newcastle upon Tyne Hospitals.—S. W. Davidson, John Gilmour, A. G. R. Lowdon.

United Leeds Hospitals.—R. E. Tunbridge, * H. G. Garland, * A. B. Pain.

United Sheffield Hospitals.—J. G. McCrie, G. L. Roberts, C. H. Stuart-Harris, * R. B. Zachary.

United Cambridge Hospitals.—L. B. Cole, H. R. Dean, Robert Ellis, Sir Lionel Whitby.

United Oxford Hospitals.—L. J. Witts, * G. S. Dawes, * J. B. Pennybacker.

United Bristol Hospitals.—R. H. Parry, C. B. Perry, * D. H. Davies, * R. G. Paul.

United Cardiff Hospitals.—R. G. Maliphant, R. M. F. Picken, * A. S. Duncan.

United Birmingham Hospitals.—Arthur Beauchamp, C. F. V. Smout, A. B. Taylor, A. P. Thomson.

United Manchester Hospitals.—W. Chadwick, R. L. Newell, Robert Platt, * R. W. Luxton, * Robert Newton.

United Liverpool Hospitals.—T. A. Jermy, J. M. Leggate, * E. Noble Chamberlain.

MEMBERS OF REGIONAL HOSPITAL BOARDS

Newcastle.—D. C. Dickson, * R. V. Bradlaw.

Leeds.—P. J. Moir, D. C. Muir.

Sheffield.—E. C. Cordeaux, J. G. McCrie, G. C. Wells-Cole.

East Anglia.—A. J. Johnson, J. V. Morris.

North West Metropolitan.—Sir Harold Boldero, Sir Allen Daley, Horace Joules, J. B. S. Lewis, Clifford Morson.

North East Metropolitan.—Somerville Hastings.

South East Metropolitan.—Sir Arnold Stott, J. R. H. Turton.

South West Metropolitan.—R. F. B. Bennett, Frank Cook.

Oxford.—F. A. Bevan, * William Ogden.

South Western.—C. S. C. Prance, * R. G. Michelmore, * G. Stewart Smith.

Wales.—Ivor Lewis, David E. Perry-Pritchard, * David Kyle.

Birmingham.—N. Duggan, J. G. Heather, H. F. Humphreys, T. McKeown, J. J. O'Reilly.

Manchester.—W. I. C. Morris.

Liverpool.—David Brown, D. R. Owen, H. H. Stones.

Medical Conferences

TUBERCULOSIS

THE fourth Commonwealth Health and Tuberculosis Conference, organised by the National Association for the Prevention of Tuberculosis, was held in London on June 21–24. It was attended by 1500 delegates from over sixty different countries and territories. The largest contingent of delegates from any one overseas country comprised 17 doctors and social workers from the U.S.A.; 14 came from the Republic of Ireland; 9 from Australia; 9 from India; 8 from Canada; 7 from Germany; 6 from the Netherlands; and 5 each from France, Malaya, Sweden, and the Union of South Africa. Turkey, Spain, Switzerland, Poland, Norway, Indonesia, Iceland, Egypt, Ethiopia, Belgium, Austria, and Finland were also represented, in addition to all the British Commonwealth countries and dependencies. The high standard and the variety of the papers and of the discussions, together with the opportunities for meeting fellow-workers—physicians, surgeons, radiologists, almoners, nurses, laymen, administrators, and others from many parts of the world—put all who participated handsomely in debt to the N.A.P.T.

During the course of the proceedings, the Duchess of Kent, the president of the N.A.P.T., made the first award of the association's Philip medal for outstanding services in the anti-tuberculosis field to Dr. P. V. Benjamin, technical adviser on tuberculosis to the government of India.

Geographical Features

Dr. JOHANNES HOLM, chief of the tuberculosis section, World Health Organisation, insisted that there is no evidence of any specific racial influence on tuberculosis, and ascribed variations between different communities to the differences in their social, economic, and technical development. Dr. Holm pointed out that the decline in mortality started with improvement in the general standard of living conditions and long before the recent therapeutic innovations. Morbidity figures, he averred, are not reliably comparable between different countries since there is no general agreement on what constitutes a notifiable case. The most reliable index of morbidity, in his view, is the age-specific proportion of tuberculin reactors. By this token London is doing well since the percentage of positive tuberculin reactors at age 1 year has fallen from 6% in 1929 to 2% in 1954, and at age 5 years from 20% in 1929 to 7% in 1953, while at age 13 years the 50% positive reactors in 1929 has been reduced to 18% in 1954. Dr. Holm suggested that the increasing evidence of the protective value of B.C.G. vaccine justifies its more extensive use and recommended its use for the children of tuberculous households and for all adolescents and adults reacting to 5 tuberculin units. He reported that up to the present the World Health Organisation has B.C.G. teams in twenty-four countries where, in campaigns assisted by W.H.O. and UNICEF, 125 million persons have been tuberculin-tested and 48 million vaccinated, almost all this work being done by trained non-medical technicians.

Dr. Holm thought that, with increasing industrialisation, tuberculosis is increasing in Africa, where only easily applicable, simple control methods can have hope of success.

Great Britain

Mr. IAIN MACLEOD, the Minister of Health, in a review of conditions in this country, referred to the steady decrease in the annual number of deaths. In England and Wales in 1954 this number was down to 7899 for all forms of tuberculosis—a decrease of almost 70% since 1939. Nursing difficulties have eased and hospital beds allocated for tuberculosis treatment have increased by about 7000 since 1948 to a total of 35,069 at the end of 1954. The waiting-list at the end of 1954 was 3000, compared with twice that number two years earlier. In some areas there is no waiting for admission. The 71 mass-radiography units in the country examine over 3 million people annually and find active tuberculous conditions in 3·3 per 1000. There were 42,348 fresh notifications of all forms of tuberculosis in 1954—a decrease of over 4000 from the previous year. "We must look to the preventive service," said the Minister, "for our next advance"; and referring to the dichotomy in the National Health Service between responsibility for prevention and that for treatment, he observed that "on the whole it ought not to work but it does."

India

Dr. BENJAMIN estimated the number of tuberculous persons in India at approximately 2½ million, and the deaths from this disease at ½ million a year. The determined national policy in India is to spend most of the available resources on preventive measures, particularly B.C.G. vaccination, which has been employed extensively since 1951. The present plan is to complete vaccination of the non-reactors among India's estimated 170 million susceptibles by 1960. Up to now over 57 million persons have been tuberculin-tested and 18 million vaccinated with B.C.G. at a rate of 2½–3 million a month. In India there are at present 180 chest clinics, and it is planned to establish 250 additional clinics during the next five years. A scheme is under way to conduct a sample mass-radiography survey of the urban and rural populations of India with the seven available mobile radiography units so as to ascertain reliable morbidity-rates for the different parts of the country.

Australia

Dr. F. R. KERR reported that here the federal government of Australia, in its determination to control tuberculosis, pays a tuberculous person living at home with a dependent wife a weekly allowance of up to £9. Everybody in the State of Victoria over 14 years of age can be compelled to undergo radiographic examination of the chest. Any notified sufferer or contact can be made to undergo a specified medical, radiographic, or bacteriological examination. There are powers to restrain any tuberculous patient who is a chronic alcoholic or a menace to the community. All newcomers from abroad who intend to stay in Australia must undergo radiographic examination of the chest within a month of arrival. Radiographic examination is also insisted on for all intending immigrants before they leave their country of departure. More than 90% of the parents of "school-leavers" in the State of Victoria accept B.C.G. vaccination.

Canada

Recognition of the relatively wide prevalence of active tuberculosis in older men has led to special efforts in British Columbia to ascertain and isolate such cases. At present 40% of all the sanatorium population in British Columbia is over 50 years of age, and 53% of the male sanatorium population is over 50 years. Travelling chest clinics are provided for outlying rural areas. Improved case-finding facilities have halved (to 12%) the proportion of advanced cases among those admitted to hospital compared with that prevailing 5 years ago. Provision has been made for all cases admitted to any hospital to have free radiographic examination of the chest.

South Africa

Dr. M. J. BRODERICK, national secretary, South African National Tuberculosis Association, estimated that in 1952 there were 100,000 cases of tuberculosis in the non-European population. There was now a scheme

to provide single-storey hospital units built in brick and iron with accommodation for 8000. The total cost of building and furnishing was estimated at £143 per bed, and the cost of maintenance of a patient at 7*s.* 6*d.* daily. These units were so designed that, if need be, they could be readily converted for housing native Africans.

Cyprus

Dr. M. G. CONSTANTINIDES estimated the prevalence-rate of tuberculosis at 3 cases per 1000 population on this island of half a million inhabitants. 211 new cases were notified in 1954. "The tuberculosis problem in Cyprus is not serious," he said, "and, judging by the progress made with control measures, the disease will be reduced to one of the lesser problems of public health in the island."

Kenya

Dr. T. F. ANDERSON, director of medical services, describing the difficulties of tuberculosis control in this country of 6 million inhabitants, estimated that there were some 50,000 cases—a prevalence-rate of 10 per 1000 inhabitants—with a preponderance in urban areas. The African, he said, goes downhill rapidly if not treated but responds well to specific drug therapy. Much is being done to improve housing conditions and nutritional standards. Domiciliary oral drug therapy has proved the most practical form of treatment. B.C.G. is not yet widely used.

Hong-Kong

Sister MARY AQUINAS, medical officer at Ruttonjee Sanatorium, described the crowded conditions of life among the rapidly increasing 2½ million population, most of whom are Chinese refugees. There are over 3500 deaths a year from tuberculosis. Shortage of hospital beds (there are 971 at present, for tuberculosis) makes outpatient drug treatment necessary for most patients. Rehabilitation is difficult. 75% of school-children are tuberculin-positive, so B.C.G. vaccination has very limited value except for infants.

Differential Diagnosis

Dr. H. J. TRENCHARD, in a paper describing the activities of his clinic in Middlesex, referred to the radiography facilities made available to and plentifully used by, local general practitioners, among whose referred cases over 2% are found to have active pulmonary tuberculosis. The other common radiographic diagnosis is bronchial carcinoma. Dr. Trenchard pointed out that among men over 65 years of age referred to his clinic, 8% are suffering from this disease. He stressed the importance of routine bacteriological examination of sputum and the value of examining every patient radiographically in two positions—postero-anterior and lordotic—to avoid missing lesions which might otherwise be hidden behind bone shadows. Dr. Trenchard has found that 10% of his patients with carcinoma of the lung also have coexistent pulmonary tuberculosis.

Dr. SVEN LÖFGREN, of Stockholm, said that, while the coexistence of tuberculosis and sarcoidosis in the same patient is rare, it is not uncommon for cases of sarcoidosis to terminate in tuberculosis. Erythema nodosum he has found as a prelude or early manifestation in both these conditions; but, whereas it is commonest as a primary sarcoid lesion in persons 20–30 years of age, as a manifestation of primary tuberculosis it is rare after adolescence.

Dr. J. G. SCADDING pointed out that the increasing incidence of bronchial carcinoma is almost a peculiarity of the British Isles, and since this condition is commonest in men at an age when pulmonary tuberculosis is also widely prevalent it is not surprising that both diseases not infrequently coexist. He stressed the importance of a complete physical examination of every patient. On sarcoidosis he expressed the view that this was not an independent disease entity but a histological reaction pattern of varied ætiology—sometimes tuberculous although the patient's tuberculin-reaction was usually negative. It was logical therefore to speak of tuberculous sarcoidosis, and most of the cases in his own series had shown evidence of tuberculous origin. He had seen the cellular reaction pattern swing from characteristic tuberculosis to undoubted sarcoid, and vice versa.

Dr. J. H. HUNT had met 28 cases of pulmonary tuberculosis in his London general practice among 3600 patients. He referred to cases of mistaken diagnoses which finally turned out to be variously due to a tortuous pulmonary artery, an erroneous sputum-test report and the misinterpreted radiographic appearance of a girl's pigtails.

Mr. DONALD BARLOW (London) spoke of the association of pulmonary tuberculosis with duodenal ulcer and indicated the desirability of thorough bronchoscopy in the diagnosis of every lung lesion (except active tuberculosis, when it could be damaging) with aspiration of secretion for examination for bacteria and fungi. The presence of aspergillosis in cavities made surgical intervention particularly hazardous. 80% accuracy could be achieved in positive cases of carcinoma of lung by cytological examination of sputa for malignant cells. Only 2% of false-positive diagnoses had been encountered with this technique in his series. Mr. Barlow mentioned the value of biopsy examination of glands removed from under the scalenus anticus for carcinoma or sarcoid. He took exception to the term "minimal lesion" in tuberculosis, insisting that such areas of lung disease often merited excision to ensure complete eradication.

Treatment

Prof. WALSH MCDERMOTT (Cornell University), discussing the choice of drugs in the medical treatment of tuberculosis, pressed for one to two years' chemotherapy for all cases. He held the view that antibacterial drugs suppress the infective process without sterilising the lesion: they do not eradicate all the invading organisms. Streptomycin, he thought, loses its efficacy after ninety days of administration. In pulmonary tuberculosis, isoniazid alone is as good as, and probably slightly superior to, combined streptomycin and *p*-amino-salicylic acid (P.A.S.). With isoniazid effective drug therapy can be applied to patients in areas where good treatment could not previously be given.

Current trends in chemotherapy were illustrated by Prof. ETIENNE BERNARD (Paris) whose crisp aphorisms included: three drugs given together are seldom an improvement on any two of them; "I cannot conceive nowadays of a case of pulmonary tuberculosis not treated with isoniazid"; "more important than the choice of individual drugs is the length and continuity of their use." The sentiment that brought him the loudest applause from an audience of physicians was: "surgery in tuberculosis is a treatment of the recent past and not of the future."

This stricture was incisively loosened by Mr. O. S. TUBBS (London), who asserted that the mortality after resection of lung lesions was now less than 2%—comparable, he said, to that of appendicitis. He regarded resection as a practical and safe procedure which saved many months of alternative treatment for the patient to whom time is important.

Dr. M. L. CONALTY (Medical Research Council of Ireland) declared that strains of tubercle bacillus resistant to isoniazid are sensitive to thiosemicarbazones, but the toxicity of these drugs precludes their wide use. However a new drug 'Hincostarch,' a synthetic polymer of isoniazid, thiosemicarbazone, and starch, having an integrated molecule, has been prepared. Its toxicity for man is low and it is effective against isoniazid-resistant bacilli.

Dr. BRENDAN O'BRIEN has used hincostarch in 9 sputum-positive cases, aged 13 to 40 years with varied types of disease, at Meath Hospital, Dublin, with distinct improvement in all after six months' treatment, starting with 500 mg. daily, increasing gradually to 2000 mg. daily. The drug is acceptable and comfortably swallowed, and in the cases treated showed no troublesome toxic effects. The sputum of 7 of the treated patients became negative within six months after treatment was started. In patients with recent cavities there was evidence of closure. Dr. O'Brien claimed only that the new drug was "worthy of extended trial."

Public-health Aspects

Prof. ANDREW SEMPLE spoke of conditions in Liverpool where, in a population of 800,000, there were 1382 new cases with 258 deaths from pulmonary tuberculosis in a year. The city had in its midst 3842 known persons exhaling tubercle bacilli. He emphasised the hazards of such patients by his assertion that 1 in every 12 new cases is a contact of a known case of tuberculosis. He called for the establishment of hostels, jointly managed by local health authority and regional hospital board, to house the uncured homeless carrier. The joint management is to ensure admission to hospital when this becomes necessary. But experience in London and Middlesex during recent years has shown that regional hospital boards can coöperate without the doubtful need to share management. Professor SEMPLE praised the activities of shipping companies which have improved living standards in ships.

On the subject of tuberculosis in industry, Dr. JEAFFRESON LLOYD (department of social medicine, University of Birmingham) recalled that 75% of factories in England employ 25 or fewer people. His opinion on the desirability of allowing known active cases to work in open industry was unequivocal. "There is no place," he said, "for the open case in open industry except in very rare cases."

This view was supported by Dr. C. H. C. TOUSSAINT (Willesden), who described the difficulty and danger of allowing known infective cases to work with healthy susceptible adolescents or young adults. "The workers in industry can best be protected from tuberculous infection by the exclusion of infective carriers," he said; and doubtless he would extend this protection to workers in commerce and elsewhere. He pressed for more sheltered workshops to accommodate the working consumptive excluded from close contact with the healthy, and argued that this country should insist on a clear chest radiograph from all immigrants coming to work here.

Mr. V. FEATHER (assistant secretary, Trades Union Congress) took up the need for employment of disabled persons in sheltered workshops to be dissociated from questions of productivity and treated simply as a social service.

Industrial medical officers and employers joined in protesting at the refusal of mass-radiography units to acquaint them with the findings of radiographs of workers even when these workers asked and agreed that this should be done.

That this attitude is not universal was made clear by Dr. H. W. O. FREW (supervisory tuberculosis physician, Renfrewshire), who gave an account of how, in a period of three weeks this year, with as little interference as possible he examined radiographically 1775 consenting school-teachers and unhesitatingly informed the school medical officer of the findings with details of the 4 who showed active tuberculosis. This coöperation was followed by radiographic examination of 277 contact pupils of these 4 cases, and among these children were found 2 with active acute primary tuberculosis of lung and 15 with old primary lesions. A neurofibroma and 2 cases of carcinoma of lung were also revealed among the teachers as a by-product of the investigation.

The decreasing yield of repeated mass-radiography in a fixed population led Dr. K. M. IRVINE (Oxford) to suggest an amalgamation of mass radiography with tuberculin testing and B.C.G. vaccination. This would undoubtedly make such desirable procedures as tuberculin surveys and school-teacher radiography much more readily available to those health authorities at present baffled how to arrange them.

RHEUMATOLOGY

THE Third European Rheumatology Congress was held at Scheveningen, Holland, from June 13 to 17.

Rheumatism and Social Medicine

The rapporteurs in this section were preoccupied with defining the extent of the social problem of rheumatism. Dr. R. J. WEISSENBACH (Paris) emphasised the social cost of the disease, and favoured education of the public and better medical organisation. In Belgium, said Dr. M. RUELLE (La Louvière), 5·5 people per 1000 population had rheumatoid arthritis, and he regarded the social organisation of rehabilitation measures as of great importance. The fight against rheumatism in Switzerland is organised on a cantonal basis, but Dr. K. M. WALTHARD (Geneva) outlined a federal Bill which would permit the Swiss confederation to subsidise rheumatism research, publicity, and hospital facilities. Dr. E. W. BAADER (Hamm) mentioned the recent discovery of silico-arthritis in miners and its social implications, and Dr. A. MASTURZO (Rome) gave an account of the distribution of rheumatism in industrial workers, and of measures desirable to minimise disability and rehabilitate affected workers.

Connective Tissue

Dr. G. C. HERINGA (Amsterdam) spoke of the significance of mucopolysaccharides in normal connective tissue. Structurally they imparted special qualities to tissue—transparency to the cornea, elasticity to cartilage, and, perhaps, the power of binding calcium to osteoid tissue. Some phenomena of allergy and specific immunity had been related to the binding of polysaccharides to protein. The metabolic rôle of mucopolysaccharides was little understood, but there appeared to be a three-sided relationship between these compounds, phosphatase, and glycogen, while the histological indications were that many other metabolic activities involve mucopolysaccharides.

Dr. L. E. GLYNN described the results of connective-tissue research at Taplow. Firstly, a clinical study of the skin reactions to hyaluronidase and to a standard irritant had shown that in acute rheumatic fever the alteration in the connective-tissue reponse to these agents was widespread. Secondly, biochemical analysis of rheumatic nodules containing fibrinoid material had shown that, in addition to collagen and elastin, the nodule contains a tyrosine-rich protein and polysaccharide, both present in greater amounts than in normal tissue. The predominant sugars obtained on hydrolysis from both rheumatic and normal subcutaneous tissue were galactose, mannose, and glucosamine. Because of the absence of detectable uronic acids from hydrolysis it was unlikely that subcutaneous connective tissues contained much hyaluronic acid or chondroitin sulphate.

The nature of the alteration to the connective tissue in "collagen" disease was also discussed by Dr. M. ZIFF (New York). As to the site of the lesion, extracts of fibrinoid material from rheumatoid arthritis nodules had been found to lack hydroxyproline; fibrinoid was

therefore unlikely to be derived from collagen, especially since patients in this disease-group show no change in their daily excretion of hydroxyproline. He and his colleagues had therefore turned to the mucoproteins of the ground-substance as a likely site of connective-tissue change. They had isolated from cartilage a water-soluble mucoprotein containing chondroitin sulphate, and of high viscosity. Leucocyte extracts caused a prompt fall in viscosity of this compound, and so did extracts of synovial tissue from patients with active rheumatoid arthritis. They had concluded that enzymes are present in inflamed connective tissue which can degrade tissue mucoprotein, and that such a phenomenon may account for the increased spreading and permeability found in inflamed tissue.

Dr. G. ASBOE-HANSEN (Copenhagen) dealt with some aspects of hormonal control of connective tissue, and particularly with the regulation of function of the mast-cells by adrenal cortical hormones. He believed that these cells were the source of ground-substance, as well as of heparin and histamine, and were one medium through which cortisone and corticotrophin regulated the production or release of these substances. He contrasted the action of thyroid hormone, which depletes the connective tissue of mucopolysaccharides and inhibits normal healing, with that of thyrotrophic hormone, which has the reverse effect. In many clinical endocrine disorders characteristic changes in structure and function of connective tissue occurred, and recent endocrinological advances held great promise for the treatment of connective-tissue disease.

Disc Degeneration and Osteo-arthritis of Spine

Dr. H. JUNGHANNS (Oldenburg) gave a comprehensive account of the structure, function, and pathology of the intervertebral-disc tissue. He considered the effects of vertebral fractures, and also the effect of disc lesions on the small intervertebral joints. The physiology and histology of disc tissue in rheumatic disease would repay thorough study.

Discussing the problem of low-back pain, Dr. S. FRIBERG (Stockholm) thought that lumbar-disc degeneration was the main local cause of chronic lumbago. This opinion was based on a wide survey of hospital and industrial communities. He also described methods of diagnostic discography, and recent studies of the response of normal and degenerate cartilage to prolonged and transitory weight-bearing.

Dr. S. DE SÈZE (Paris) distinguished two groups of spondylitis patients: one with disc changes and osteophytic proliferation; the other without osteophytes but with definite disc changes. He adduced experimental evidence that mucopolysaccharide from the nuclear pulp can stimulate osteogenesis.

Dr. PEDRO BARCELÓ (Barcelona) gave a systematic account of the embryology, anatomy, and anomalies of the interzygapophyseal joints, and described their pathology and the possible mechanisms producing arthrosis. He interpreted the manifestations of spondylitis in terms of the anatomical relations between the spinal roots, joints, and vessels and the sympathetic nervous system, and discussed the pathology of the costo-transverse and costovertebral joints.

Rheumatic Fever

The use of antibiotics in prophylaxis was discussed by Dr. G. H. STOLLERMAN (New York). Prompt treatment of group-A streptococcal infections prevented initial attacks of rheumatic fever, if the organism was permanently eradicated. Penicillin was the drug of choice, and must be given in such a way as to maintain adequate tissue concentrations for at least ten days. This treatment should be applied also to patients with acute rheumatic attacks, who should thereafter be maintained on a prophylactic regimen indefinitely. The effectiveness of prophylaxis could be assessed by monthly anti-streptococcal-antibody determinations.

A study of the frequency of rheumatic heart-disease in Rotterdam school-children was presented by Dr. P. VAN DER MEER (Rotterdam). In a large sample 2·4% had definite or probable rheumatic heart-disease, and 13% of these had some signs of activity; only 37% had a history of a previous rheumatic attack.

The treatment of rheumatic fever was discussed by Dr. F. COSTE (Paris), who favoured hormone therapy; he claimed that this was superior to aspirin in reducing cardiac involvement. He thought that phenylbutazone, too, was better than aspirin but less effective than hormones.

Dr. E. G. L. BYWATERS (Taplow), however, reported a large clinical trial of the comparative value of corticotrophin, cortisone, and aspirin in the treatment of rheumatic fever, carried out jointly by the Medical Research Council and the American Heart Association, which led to the conclusion that none of the three agents resulted in uniform termination of the disease, while fresh manifestations developed in some patients during treatment with any of the three.

A NEW STUDY CENTRE

During the congress a ceremonial meeting was held at the Trippenhuis, Amsterdam, with Prof. P. FORMIJNE in the chair, to set up an International Study Centre for Rheumatic Diseases. This celebrates fifty years of work in this field by Dr. Jan van Breemen, until recently director of the Consulting Bureau for Rheumatic Diseases, who will now be devoting himself to the new project.

Dr. VAN BREEMEN said that though the efficient weapons against rheumatism were still few, as Claude Bernard had said, *L'homme peut plus qu'il ne sait*. The wise statement of Disraeli that the chief task of any statesman must be the care of the public health appeared still to be unheeded in many countries, where the budget allowed so poor a sum for that service compared with what came in so abundantly for others. Prof. J. GOSLINGS (Leyden) said that in the proposed study centre special conferences on special subjects would be organised, bringing forward the findings of ten to twelve research-workers on one given topic. Funds would have to be raised by rheumatologists in their own countries, and he asked for help in this plan, in finance and in personnel. Prof. LOUIS DE PAP (Portugal) recalled how, in his own efforts to found a rheumatism research centre at Budapest, he had been fortified by van Breemen from afar. All had been ready for realisation of the idea when outside events had checkmated it; and he rejoiced that it was now to the fore again. As one of those who with van Breemen, Alison Glover, and Fortescue Fox founded the International League, Dr. J. FORESTIER (Aix) spoke of van Breemen's "luminous intelligence" and energy. Never resting, never satisfied, he had spurred them on to form the international group before even the national groups were formed. Prof. N. V. JARLOV (Copenhagen) said that the world of rheumatism was not national but international, and all the fragments of research and practice must be welded together into one whole. By the efforts of van Breemen, something of this great aim had already been achieved. Dr. F. J. BACH (London) was glad to see van Breemen's dream coming true, for this dream did not replace reality but would provide a most important new home and centre to which rheumatologists could come—as he had done—for guidance, discussion, and inspiration. Prof. J. MICHEZ (Brussels) said that the formation of the Belgian League against Rheumatism was mainly due to van Breemen, and Prof. E. REICHER (Warsaw), speaking of the effect his work had had in Poland, presented him with honorary membership of the Polish Society for Rheumatism and a map showing all the Polish centres for diagnosis and treatment. Prof. N. CH. SVARTZ (Stockholm) conveyed the admiration of her Swedish colleagues; Prof. P. BARCELÓ (Barcelona), in the name of Spanish rheumatologists, expressed their hope for the success of the research centre; and Prof. H. TICHY (Dresden) offered his thanks for the foundation of the German society in 1927, which was due to van Breemen and the

International Committee. Prof. A. NESTEROV (Moscow) said that there were two branches in the problem of combating rheumatism: (1) demand for a campaign, in which struggle van Breemen was foremost, and (2) prevention, in which, so far, little had been done. That was why they promised to help build this building, brick by brick, a task which he believed doctors from all countries would wish to join in. Prof. K. M. WALTHARD (Geneva) proposed that the new centre should be called the Jan van Breemen International Study Centre for Rheumatic Diseases. Prof. A. ROBECCHI (Turin) declared that van Breemen had created a fraternal unity among rheumatologists, he had created rheumatology; Prof. F. LENOCH (Prague), speaking in Latin, brought best wishes from the ministry of health and the Charles University at Prague; and Dr. O. E. SCHULHOF (Budapest) said that if every country which felt gratitude for van Breemen's pioneer work spoke on this occasion there would be no end.

Winding up for the Netherlands, Dr. G. VAN DAM (the new director of the Consulting Bureau for Rheumatic Diseases) said that these accounts of what the International League against Rheumatism had meant to their colleagues in other countries confirmed the Dutch faith in the new centre.

Medicine and the Law

Care of a Patient on a Trolley

JUST before midnight on March 17, 1953, an old lady of 86 was admitted to a hospital with abdominal pains. She was put on a four-wheeled trolley about 2 ft. wide and 2 ft. 6 in. high and which had no edge or rail, and was wheeled into a cubicle. A doctor and nurse went in to her and after examining her the doctor left. The nurse left the patient and she fell off the trolley, breaking her thigh. She sued the hospital for damages alleging negligence in that: (1) they left her in her then state of health on the top of a narrow trolley from which they knew or ought to have known that she might fall; and (2) they left her on the trolley without anyone in attendance and without there being a guard-rail or other means of preventing her from falling off. The plaintiff's son gave evidence that the doctor and nurse went out of the ward and that the patient had been left alone for five minutes. The evidence for the hospital was that the doctor had been in the next-door cubicle, that neither he nor the nurse had left the ward, and that the nurse had gone to answer the telephone and had only left the patient for thirty seconds before she fell. The doctor said that had he thought special precautions necessary he would have given instructions, but he did not think that necessary. The nurse said that the condition of the patient was such that it never entered her head that she could not be left. Lord Uvedale gave evidence that in his hospital there was one attendant per trolley, night and day, and, on the basis of the son's evidence and the medical reports his opinion was that it was unwise and a mistake, but not improper, to leave the patient alone.

Mr. Justice Gorman, summing up, said that the duty of the hospital was to take reasonable care in all the circumstances. Those who went to hospital were entitled to expect that doctors and nurses would exercise such a degree of skill and care as normally skilful members of the medical and nursing professions might be expected to exercise and as accorded with the general approved practice. The jury could not guess how the accident happened and the plaintiff had to prove that there had been negligence. They had to make up their minds, on the evidence, on the questions: what was reasonable care here; what the negligence was; and, if there was negligence, what were the damages.

The jury returned a verdict for the plaintiff awarding damages of £100; they added a rider to the effect that they felt that someone should be in attendance at all times on a patient on a trolley, or else the trolley should be supplied with guard-rails.

Counsel for the hospital submitted that there was no evidence on which the jury could have come to their verdict and that the decision showed that they had misunderstood the plaintiff's case. He asked the Court to hold as a matter of law that to say that hospital staff must always at all times be in attendance on a patient on a trolley was much too high and that there was no such duty.

Mr. Justice Gorman said that the cornerstone of that submission was the rider added by the jury. He did not think that he was justified in determining the case purely because of the jury's rider or in saying that that was the only reason why the jury had come to their decision. It was open to the jury to accept the evidence of the plaintiff's son that she had been left for five minutes, and that of Lord Uvedale who had said that it was unwise to leave her alone. Judgment for the plaintiff for £100.

SMITH *v.* LEWISHAM GROUP HOSPITAL MANAGEMENT COMMITTEE —*Queen's Bench Division:* Gorman *J.* and a Jury: June 20, 1955. Counsel and solicitors: W. G. Wingate (Pattinson & Brewer); Michael Lee (Levett, Son, & Piffe-Phelps, Bromley).

J. F. LAMB
Barrister-at-Law.

Recognition of Industrial Hazards

A 22-year-old woman worked from July to September, 1947, at the research laboratories of the defendants, a branch of Philips Electrical Ltd., on an experimental process for producing fluorescent-lighting tubes, which entailed her working with beryllium oxide and zinc beryllium silicate. She left in October, in perfect health, but in July, 1948, she became unwell, and was diagnosed as suffering from chronic beryllium poisoning. In an action for negligence she claimed that the employers knew, or ought to have known, that beryllium was highly toxic to human beings. Mr. Justice Gorman dismissed her claim, saying that he was not satisfied that the employers ought to have known that their process was dangerous. The plaintiff appealed. The Court of Appeal, Lord Justice Denning dissenting, dismissed the appeal.

LORD JUSTICE DENNING said that as a result of her two months' work with a substance which was a deadly poison, this young woman's life had been ruined; but the employers refused to compensate her because they said that at the time they did not know that the substance was dangerous. They had been buying fluorescent powder for several years from other large concerns which had never hinted that they were dangerous; their own workmen had used the powders and had had no trouble; and neither their American associates nor their research chemist had given warning of any danger. The employers had, however, frankly admitted that if they had suspected beryllium was toxic, they would have made a literature search which would have put them on their guard. If, firstly, they had made a search, they would have found in their own library an entry showing that these compounds were dangerous. Other articles were available in England at the time, in the Patent Office library and probably in the British Medical Association library. As long ago as Oct. 9, 1943, the *British Medical Journal* had published an article on the "toxic hazard of beryllium." If, secondly, they had asked their medical officer to study the situation, he would have reported that the substance was dangerous, as their own medical officer had admitted in evidence. But they did not discover its dangerous nature until December, 1947, after the plaintiff had left their employment. By 1948, its dangers were known to be so great that its use was given up.

His Lordship thought that in exempting the employers from any liability to pay compensation to the plaintiff Mr. Justice Gorman had failed to recognise the high duty of care which the law placed on everyone who dealt with things dangerous in themselves, as was this compound. The law required such persons to take the

greatest possible precautions, not only to avoid the danger when it was known, but also to find out whether there was danger or not. The employers ought to have suspected it until it was proved harmless. They were starting what they had called an "experimental process." It behoved them not only to call in their research chemists to tell them how to make it, but also their medical officers to advise them whether it was safe for their workers to handle. It did not seem right that a great concern should exploit a new process at the risk of their workers without a word to them of the dangers it entailed. He would allow the appeal.

LORD JUSTICE BIRKETT said that the only question before the Court was whether the defendants ought to have known. For the plaintiff it was said that a literature search should have been made. The question was: When? Before they began to use powders purchased from other concerns? Or in 1943, when they began using beryllium oxide for radio valves? Or when they first began making the powder themselves in 1945 or 1946? The growth of knowledge as to the nature of beryllium compounds was not rapid. Even the paper published in the United States in July, 1947, which first really enlightened the industry, contained the significant words that "the case against beryllium is not clear cut." His Lordship could not think that the employers were under a duty of care so stringent as to amount practically to a guarantee of safety when they had no knowledge of the danger and all their experience was to the contrary. He would dismiss the appeal.

LORD JUSTICE PARKER, agreeing with Lord Justice Birkett, said that little was yet known of the disease contracted by the plaintiff, save that it was of a delayed-action type. The intensity of the disease bore no direct relation to the concentration of the exposure. While most people were unaffected, there were those in whom the inhalation of but one speck of the powder would set up the disease. On the question of duty, if there were any reason to suspect that a substance was likely to be toxic, a reasonable and prudent employer should make a search such as had been suggested, particularly if the substance had not been used or manufactured before on a commercial scale. But if there were no reason to suppose it was toxic, and it had been used and manufactured for some time by others without ill effects, there was no reason why an employer should do more than act in accordance with the general principles of hygiene observed where a dusty process was involved. His Lordship could not believe that if any of the companies which had supplied the powders to the defendants had been aware of the danger, their knowledge would not have been available in the trade generally. He agreed with the Judge that the plaintiff had not proved any breach of duty in the failure to make an exhaustive search for any literature concerned with these substances.

Leave was given to appeal to the House of Lords.

HARMAN *v.* MITCHAM WORKS LTD.—*Court of Appeal:* Denning, Birkett, and Parker *L.J.J.*: June 21, 1955. Counsel and Solicitors: Tristram Beresford, Q.C., and Peter H. Ripman (Lewis, Holman, and Lawrence for Ross and Son, Horley); E. Ryder Richardson, Q.C., and Ronald Hopkins (Carpenters).

M. M. HILL
Barrister-at-law.

Electroconvulsant Treatment

"I hope I will not have to consider any case in the future in which there is therapy involving loss of consciousness and a cessation of breathing, however short, on the part of the patient, where only one doctor is present to administer the therapy and look after the patient in an unconscious state."

These remarks were made by the North Bedfordshire coroner at the inquest [1] on a man who had died during electroconvulsant treatment. The patient had recently undergone an operation on one lung and afterwards suffered from acute melancholia. He was admitted to the Three Counties Hospital, Arlesey, where it was decided to administer a modified form of electroconvulsant therapy evolved at the hospital a year ago and now adopted by a dozen other hospitals in the country. The treatment was administered by a registrar with the assistance of four of the nursing staff.

Evidence was also given by an assistant psychiatrist at the hospital who had originated the treatment and the machine by which it was given. He agreed that everything ought to be done to protect a patient, but between 4000 and 5000 such treatments were given every year at the hospital and it would be impossible to have a trained anæsthetist present on every occasion in addition to the doctor giving the therapy.

The coroner suggested that in a case such as this, where the patient had recently had an operation for lung trouble, a second doctor might well have been present to provide controlled respiration. He recorded a verdict that the patient had died from spontaneous pneumothorax and chronic pulmonary tuberculosis and that he died by misadventure after electroconvulsant therapy.

1. *Bedford Times*, June 10, 1955.

Explosion during Electrical Cauterisation

A girl, aged 11, was undergoing an operation for the removal of her adenoids by electrical cauterisation when an explosion occurred in her mouth. Artificial respiration was applied, after which the patient's heart-beat became normal, but she died some days later. Death was stated to be due to toxæmia and bronchopneumonia caused by burning of the lung, mouth, and tongue.

From the evidence given at the inquest,[1] it appears that the anæsthetist administered ether to the girl. The surgeon had informed the anæsthetist that it was his intention to use the electrical cautery; when he asked if there were any precautions to be taken, he understood the anæsthetist to say "No." He did not ask what anæsthetic had been given. He was nearing the end of the operation when the explosion occurred, there being a flash and a flame in the girl's throat.

The coroner said that he was satisfied on the evidence that there was no criminal negligence. A verdict of death by misadventure was recorded.

1. *Manchester Daily Dispatch*, June 18, 1955.

Parliament

Medical and Health Services in the Colonies

SPEAKING in a debate in the House of Commons on June 21, Mr. HENRY HOPKINSON, Minister of State for Colonial Affairs, said that, though we still had a long way to go in providing medical services in the Colonies, the recent *Report on the Colonial Territories* showed that the medical and health services had been not only maintained but considerably expanded. There was growing evidence of mastery over some of the preventable diseases and of the increasing consciousness among the public in the Colonies as to the causes of these diseases and their willingness to take measures to deal with them. In particular more and more attention was being paid to tuberculosis, as was shown by the appointment of Prof. F. R. G. Heaf as consultant on tuberculosis. The Government had realised that it was better to have doctors from overseas, whether they were expatriate or local, whether from the Far East or Africa, or from other dependencies, and to have them trained in the treatment of tuberculosis in this country. There was a steady stream of medical officers coming over to study for the diploma in tuberculosis diseases at Cardiff. Many of these doctors went back to their territories and carried out work of a high order.

In many overseas territories tuberculosis hospitals were now being built, and small tuberculosis annexes were being set up in rural areas to meet local needs. Surveys had been made, and people found to be tuber-

culin-negative had been given protective vaccination. In Jamaica 636,697 people were tested and 99·6% of those found negative were vaccinated. This was probably one of the most successful campaigns carried out anywhere in the world. Similar things were happening throughout the territories—in the Falkland Islands dependencies, in Singapore, and also in Malaya, where the disease was very prevalent, and where about 20% of hospital beds were devoted to tuberculosis work. In Hong-Kong, where, in conditions of extreme overcrowding, tuberculosis was a matter of deep concern, a strong department had been working with considerable success. In East and Central Africa, West Africa, and the South Seas anti-tuberculosis work was going on. At the moment attention was being concentrated on this problem as never before, and he thought it might fairly be said that the work undertaken in the so-called underdeveloped countries under British tutelage would stand comparison with that done anywhere else in the world.

QUESTION TIME

Scottish Tuberculosis Waiting-lists

Replying to a question, Mr. NIXON BROWNE said that, at April 30, 334 men and 199 women in Scotland suffering from respiratory tuberculosis were waiting for hospital beds. For Glasgow the figures were 111 men and 59 women. The figure last year for Scotland was 1872. The waiting-time for urgent cases was now not more than seven days. The waiting time in Glasgow for non-urgent cases was three months.

Diesel-engine Exhausts

Replying to a question, Mr. J. R. BEVINS, parliamentary secretary to the Ministry of Works, said that, under the auspices of the Medical Research Council, the exhaust-products of diesel-engines under different running conditions were being examined for cancer-producing substances. Information was also being collected to discover if there was any statistical relationship between the presence of various atmospheric pollutants and the incidence of lung cancer.

Sir FRANK MEDLICOTT: Is the Minister aware that the increase in the number of cases of cancer of the lung has coincided in a quite remarkable way with the increase in the use of oil as engine fuel, and that it was stated at a recent meeting of the British Medical Association that, although it may appear to be only a coincidence, it is too sinister to be disregarded?—Mr. BEVINS: At the moment, it is simply a coincidence. It is known, however, that diesel exhaust-fumes contain a great deal of soot, which in turn contains certain hydrocarbons which induce cancer of the skin. It is not yet established that they can produce cancer of the lung.

Mr. ARTHUR WOODBURN: Is the Minister aware that in America experiments showed that the increase in cancer of the lung is going on as rapidly in the country areas as in the towns? No further reply was given.

Toxic Chemicals in Agriculture

Replying to a question, Mr. D. H. AMORY, Minister of Agriculture, said that he had received the report of the Working Party, under the chairmanship of Prof. S. Zuckerman, on the risks to wild life arising from the use of toxic chemicals in agriculture. This report completed the survey of the precautionary measures needed in using these chemicals in agriculture. The view was expressed that in a normal season in Britain the number of casualties to wild birds and animals caused by spraying was not particularly high compared with other causes of death. The Working Party did not consider that further legislation was needed at present. They recommended that further research was urgently needed, and that the risks to wild life arising from the use of toxic chemicals in agriculture should be kept under review by the Interdepartmental Advisory Committee and that the committee should include representatives of nature conservation interests. The importance of certain precautionary measures should be made clearly known to spraying contractors, farmers, growers, and bee-keepers.

Fitness of R.A.F. National Service Men

Replying to a question, Mr. G. R. WARD, under-secretary of State for Air, said that the number of National Service men discharged from the R.A.F. on medical grounds in 1952–53 was 1323 (3·7% of those entering), in 1953–54 1115 (3·0%), and in 1954–55 886 (2·4%).

In England Now

A Running Commentary by Peripatetic Correspondents

I DO not like the sea, but by some inexplicable Mendelian freak have a family that does. Each summer I have to spend two weeks as a house-husband (if that is the correct masculine of house-wife). For to me, as to Lewis Carroll,

> There are certain things, as a spider, a ghost,
> The income-tax, gout, an umbrella for three—
> That I hate, but the thing that I hate the most
> Is a thing they call the Sea.

Thus around this time of year my family depart and I am left to fend for myself. My wife leaves me with detailed menus, written instructions about the milk, bread, and laundry, a well-stocked refrigerator, and a short résumé of the more important recent advances in the science and art of housekeeping; for as I regale her with the latest news about antibiotics and blood chemistry so she reciprocates with practical hints from her more colourful magazines. Looking back over the past ten years the changes have been extraordinary, equal indeed to the rapid advances made in medicine during that time. No longer is one tied to the tin. Frozen food is the order of the day. A chop or a portion of pork or chicken can be prepared in 20 minutes complete with appetising gravy, and no complicated cooking involved; indeed the meat can be cooked by merely placing it over the top of the boiling potatoes. Tinned fruit still makes a good sweet, but with the family away one can buy an assortment of ripe cheeses (in 2-oz. portions) without attracting critical remarks that "the cheese is bad." Catering for yourself for a week or two can now be a pleasure and a delight. Mere man cannot be expected to keep within his housekeeping allowance, and he can subsidise himself without any awkward questions being asked. And as for the rest of the housework, is that such a bind? Not really. Take a mild sedative at night (double whisky or half a barbiturate), sleep soundly, and the bed won't need making. Eat in the same room as the wireless, television, and gramophone so that you use only one room, and, with the children away, a weekly dust will suffice. As regards washing-up use as little crockery and as much detergent as possible. Eat well, relax, and contemplate, and remember to be incompetent and full of the difficulties of your struggle for survival when the family returns; for then, if you've played your cards right, you may go off on your holiday.

* * *

In the course of his work a man may acquire reflexes which are of value to him in performing his job efficiently. That this may have corresponding disadvantages was shown by a recent clinical memorandum in the *Daily Express* (June 20). Paul Macias, the world bantam-weight champion, was being anæsthetised; the anæsthetist started to intone one, two, three . . . All was well until "nine" was reached, when the champion made desperate efforts to get to his feet; he wasn't going to be down for a count of ten. There may be a lesson here for anæsthetists; always use a technique suitable for the individual patient.

* * *

Starting a diabetic clinic in the tropics had its obvious snags. How many grams of carbohydrate in breadfruit, yampee, and so on. How much fat in the ackees—to say nothing of the mystery of the composition of the local ice-cream. But it was the unexpected difficulties that nearly beat us. Where were we to put that donkey now that the old lady who rode to us from the hills really had to stay in hospital because of her gangrene and severe ketosis? How could we instruct the new Chinese patients? Then we remembered Dr. H. Of course, he spoke Chinese. I thought our last problem was solved.

And so it was till one hot afternoon when the crowd outside the clinic was bigger than ever and the customary percentage of notes had not yet come from records and our composure was sorely tried. Then my Chinese patient came in wearing his usual delighted grin. Where was his special diet-sheet that we'd spent so much time

over? He'd lost it, or left it behind again. Well, then, what about his four specimens of urine? Nurse said he hadn't brought those either. From his many gesticulations, pidgin-English, and chuckles, I understood he had. But the nurse was adamant, and I was by then exasperated. "Go and see the Doctor-who-talks-Chinese" I said, sending him off while I started on the next patient. But I couldn't give her my full attention; I got so intrigued by the "Hong, Fung, Pong, Whung" noises going on at Dr. H's table round the other side of the screen. And then when I heard the Chinese patient add in English ". . . and he run like hell" I could contain my curiosity no longer. It transpired that he had remembered his specimens, but while he was walking to the hospital through the market, clutching them, wrapped up in a brown-paper bag, in his hand, a thief had grabbed the bag.

* * *

After a series of misfortunes due to the various transport strikes, this peripat found himself on a French ship endeavouring (in vain) to arrive at the Toronto conference on time. His morale was rather shattered on discovering that his status on board was that of a "distressed British subject." It was, however, partially restored at the emergency boat drill attended by the passengers arrayed in life jackets. "Mesdames et Messieurs," began a French voice over the loudspeakers, "your discipline today is of an importance the most significant" and continued for at least ten minutes in an impassioned pep talk. The invisible orator finished by saying that his so distinguished English colleague would now translate his speech so that all could profit. There was a click and an impeccable Oxford voice said "Good show chaps, over."

* * *

The kindness of our overseas colleagues can be embarrassing at times. After a dinner of a Canadian specialist association in Toronto I was horrified to hear the president refer to me as follows:

"I will now ask Dr. ——, a most distinguished visitor, to rise so that we can all see him properly. Dr. —— was born in London, England, and is happily married with two fine boys and a sweet lil' girl. We will show our appreciation of this historic visit in suitable fashion." (Terrific applause.)

The hyperæmia of my auricular appendages still persists.

* * *

At my last hospital *The Lancet* was supplied direct from the publishers to the laboratory. Now I am attached to a large hospital in South West Scotland renowned for its teaching and its administration, where I find things are done more efficiently, or at any rate more is done.

The hospital places an order with a local bookseller who directs that *The Lancet* be sent to him. On its arrival a record is made and a messenger despatched with it to the Hospital Stores Department who in turn record its receipt and send it up to the Superintendent's office. The Superintendent's secretary also makes a note of its arrival and then sends a messenger to my secretary who has to sign for it, and finally it is handed to me. At my old hospital I got *The Lancet* regularly on Friday morning; it is now Tuesday afternoon before I can find out what has happened In England Now.

* * *

My peripatetic colleague, who otherwise displays a specialist knowledge of water-closets, has missed two monstrosities.

The first is "convenience," a hideous word which I suspect derives from the Victorian era.

The second I met when visiting the New York World's Fair in 1939. Searching desperately for a "rest room" I was at last constrained to ask a policeman, who said witheringly "Can't you read, Bud?" And sure enough I was standing under a large sign labelled "comfort station."

* * *

The Dwindling Waiting-list

Dear Dr.,

I am not coming in for I am OK and you no what you can do with your bed.

Miss M heath.

Letters to the Editor

TUBERCULOSIS IN KOREA

SIR,—I have been reading with great interest the letters on sanatoria. I have just finished the ones in your issue of March 5, which has only just reached me (two months is the average time for ship mail to get here).

We began a small tuberculosis sanatorium in this area of South Korea in October, 1951, and it has grown in equipment, staff, and beds just as fast as these items were secured. We now have 120 inpatients on sanatorium treatment plus a fairly high proportion on pneumoperitoneum. We do no major surgery.

Our chest clinic has been and is following about 1000 cases of active tuberculosis in this area. There is a waiting-list of approximately 150, most of whom are infectious and living in very crowded homes. There seems to be no end to the need for more sanatoria and chest clinics in South Korea to try to handle this number-one health problem. So far very little is being done in the whole country because of the lack of funds and trained physicians.

It is such a contrast to read articles from England and the United States when many discussions centre around "what to do with empty beds." If we had 1000 beds instead of 120, I am sure they would be filled with active cases in a matter of a few weeks.

Is there any means by which some of the experience, personnel, equipment, and funds of tuberculosis associations and groups in Britain and the United States could be channelled this way? I would think that individual doctors or teams sent here for periods of 2 or 3 years could do much good. Such groups should, however, need to have adequate financial backing or access to drugs, &c., to carry out the recommendations they would make.

We find ourselves trying to do too many things and not doing any thoroughly. I have a Korean doctor, 12 nurses, and a total hospital staff of 40. What is needed in this area is a good home-treatment programme that would be integrated into the sanatorium.

Right in this city of 120,000 people, the capital of a province of 3,000,000, with a heavy incidence of tuberculosis and where our hospital is the only one devoted entirely to the disease, there is a large Korean medical school and college hospital. However, whereas there should be several hundred tuberculous patients in that hospital, there are only 5 at present for the lack of a chest physician to lead such a programme.

We foreigners, 6 families, of the Presbyterian Mission constitute most of the permanent foreign population. There are U.S. soldiers in our area but only temporarily.

If a chest physician were interested in coming here to help in a virtually uncontrolled tuberculosis problem, I will find comfortable quarters for him for as long as he could remain. We could not do this, however, without added financial help. There is an opening here for any preference that may be mentioned: teaching the students and local doctors (in English); developing the chest clinic at the medical-college hospital; aiding our own private hospital in either its inpatient work or chest clinic. A new building now under construction will raise the number of beds to 160. We have lately established a connection with a general surgical hospital, where we send suitable cases.

There will be many discouragements and problems, but one who is genuinely interested in the work will, I feel sure, derive great satisfaction from doing a much-needed service.

Presbyterian Tuberculosis Hospital,
Yangnimdong, Kwangin,
Cholla Namdo, Korea.

HERBERT A. CODINGTON
Superintendent.

TREATMENT OF CHRONIC AMŒBIC DYSENTERY

SIR,—Dr. Andrade would make me believe that the last word on all aspects of amœbiasis has been said and any conception at variance with his own is a misconception. In his letter of June 11 he says excystation does not occur in the lumen of the bowel in the same host, and the cysts therefore are not parasitic and are harmless to the host in whose bowel they have been formed.

Hakansson,[1] however, holds that the cysts in the intestine which survive develop into trophozoites. These subsequently divide and so bring about an increase in the amœbæ, which may remain as trophozoites or become encysted. He thinks the so-called cyst-carrier will pass trophozoites from time to time when the stools become more liquid.

From my own observations I have reason to believe that excystation may occur in the cæcum, although results of single experiments may be negative. Apparently, excystation depends on the activity of the chyme reaching the cæcum. Also, cysts which regurgitate into the ileum may undergo excystation there. Barium-enema studies reveal that in dysentery regurgitation into the ileum from the cæcum is commoner and more marked than in normal persons.

Hence, for the reasons I gave in my letter of May 28, cysts should be treated. Till 100% successes are established by the use of oral-cum-systemic amœbicides acting on trophozoites only, Dr. Andrade has no justification for pressing his point that cysts should not be treated.

Military Hospital,
Lucknow, India. INDER SINGH.

SIR,—In their letter of June 11, Dr. Armstrong, Dr. Wilmot, and Dr. Elsdon-Dew have rightly corrected me for stating that the presence of cysts is indicative merely of an infection of the bowel *wall* with amœbæ. Nevertheless, although it may be true that the majority of cysts develop from lumen-dwelling commensal amœbæ (90% of infected persons are symptomless cyst-passers), it has not yet been shown for certain that amœbæ which have been extruded into the lumen of the gut along with the contents of an ulcer are incapable of encystation. However, the elucidation of this problem is not of any great importance to the clinician who but needs to know that, in an infestation, amœbæ may be situated intramurally, intraluminally, and on the surface of the intestinal mucosa as well as extraintestinally. With this knowledge he is in a position to prescribe, rationally, a combination of amœbicides in an attempt to destroy the amœba in its various locations.

In support of the theory that cysts are derived solely from trophozoites living in the lumen of the gut Dr. Armstrong and his colleagues seem to point to the clinical fact that patients with amœbic dysentery pass only trophozoites, whereas in amœbiasis without symptoms or with mild symptoms cysts are passed almost exclusively. The logic of this deduction is too profound for me to follow. To me it seems that the clinical observations I have referred to can be accounted for by the fact that when there is diarrhœa some amœbæ are passed rapidly down the bowel to the exterior, whereas when there is no diarrhœa, the amœbæ are conveyed slowly down the bowel and so have time to secrete around themselves a cyst wall. It is the time taken in passage to the exterior in the fæces—and not the location of the amœbæ in the gut—that determines whether the parasites are voided in the amœboid or in the cystic state.

May I now guide this correspondence back to the main purpose of my letter of March 26, which was to point out that it is irrational to prescribe a drug specifically because of its reputed power to destroy cysts, since this ignores the fact that cysts in the fæces can only be derived from active amœbæ present in the gut?

Calcutta. C. B. ANDRADE.

1. Cited in Stitt's Tropical Diseases. 8th ed., London; p. 486.

HEROIN

SIR,—Your leading article of June 25 is doubly unfortunate: firstly, in its conclusions, and secondly, in the manner of its timing—while the Home Secretary is considering the representations of the British Medical Association.

You sum up the position admirably in your leading article, and then sentence the jury instead of the prisoners; and when the former protest, you ask them to be good boys and coöperate. In fact, you make the same error as the countries abroad which do suffer from heroin addiction. They tell us of their problem and implore us in sympathy to wear sackcloth and ashes, or at least a black diamond over the left deltoid. Apart from the inconvenience, such things are a little old-fashioned nowadays. Did not the U.S.A. start wearing a black patch thirty years ago?

We hear much of the W.H.O. expert committee on addiction drugs. It was interesting to note at the recent annual representative meeting of the B.M.A. that the motion on heroin was presented by Aberdeen, Kincardine, and the Orkneys and Shetlands, comprising a band of shrewd, sound, and practical rural general practitioners.

These are the real experts on heroin—men who use it every day, instead of sitting round a table moaning about it. I suggest that the controlled trial you propose be carried out in Aberdeen county, instead of in some stuffy city hospital. The experience would be exhilarating for the investigators and the results certain.

Your main conclusion that a ban here will influence favourably the Far East or certain Mediterranean countries is a very naïve one, and of most doubtful efficacy. It is a poor thing when balanced against the practical considerations brought forward by your correspondents.

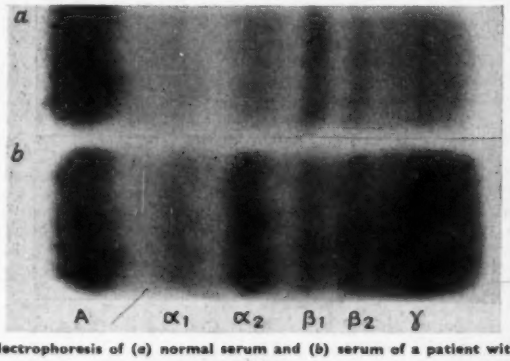
Ropley, Hants. J. S. HAPPEL.

ELECTROPHORESIS OF PLASMA-PROTEINS

SIR,—In view of the somewhat contradictory results presented by Dr. Owen (April 23) and Dr. Consden (May 14) we feel we should point out that distinct well-separated double β-globulin bands are regularly obtained when analysing fresh sera, if a 'Veronal' buffer of ionic strength 0·1–0·05 containing 1·25 millimols Ca^{++} is used.

A good separation between albumin and α_1 is also obtained if the papers are moistened with a buffer with 20–50% higher ionic strength than the buffer in the electrode vessels. The mean value for the normal β_1 fraction is 0·50 g. per 100 ml. and the S.D. 0·055, and the mean value for β_2 is 0·35 and the S.D. 0·045. The accompanying figure shows the clear separation of the β fraction which we obtain by this method.

The β_1 fraction contains transferrin and is relatively rich in carbohydrate. The β_2 fraction contains the so-called β_1-lipoprotein and some other proteins, but is poor in carbohydrate. The β_1 and β_2 fractions increase during normal



Electrophoresis of (a) normal serum and (b) serum of a patient with empyema.

pregnancy. The β_2 fraction increases in all diseases with increased β-lipoprotein concentration as well as in acute and chronic infections and in advanced malignant diseases.

The β-splitting observed in pure borate buffers by Dr. Consden is not of the same nature as that reported by us since in borate the β-lipoprotein migrates with the β_1-component. On the other hand, the β-separation reported by Owen and earlier by Wiederman,[1] may be of the same type as that we obtained when using a calcium-free veronal buffer with an ionic strength of more than 0·1. Similar results can readily be obtained with buffer at lower ionic strength if the apparatus used permits a high rate of evaporation. As regards the β-lipoprotein, this separation is of the same type as that obtained with calcium.

Departments of Clinical Chemistry in Malmö and Lund, University of Lund, Sweden. C.-B. LAURELL S. LAURELL.

LOW-LACTOSE MILK FOR CONGENITAL GALACTOSÆMIA

SIR,—Like Mr. Salt and his colleagues (June 4) I have found the Trufood low-lactose milk powder perfectly satisfactory in the treatment of one case of galactosæmia. This patient was treated with 'Nutramigen' until the age of 1 year and made good progress with this food. She then, however, became reluctant to take it, and partly because of this, and partly because of the difficulty involved in obtaining supplies of nutramigen, she was given the low-lactose milk which Messrs. Trufood kindly supplied. She appears to find this food more to her liking and continues to make good progress.

Leicester. W. J. MATHESON.

DIAMOX IN GLAUCOMA

SIR,—I have read with great interest your report (May 7) on the symposium on this subject, held at the 75th congress of the Ophthalmological Society of the United Kingdom.

The beneficial effects of acetazoleamide ('Diamox') on intra-ocular pressure, no matter what its mechanisms, remind me of similar results obtained with mercurial diuretics in primary glaucoma.[2] That the ocular fluid content may play a rôle in the regulation of ocular tension is borne out by experimental[3] and clinical observations (fall of ocular tension in states of dehydration, e.g., diabetic coma).

I had come across this question in the course of studies concerned with the relationship between primary glaucoma and pituitary-hypothalamic disorders. In 16 of 22 cases examined, such a relation was in fact established both on clinical grounds and on the strength of various metabolic phenomena suggestive of pituitary-hypothalamic involvement. Among the latter a tendency towards water and salt retention was a notable feature in a number of cases.

I therefore tentatively gave mercurials with a view to lowering intra-ocular pressure by means of dehydration and was favourably impressed by their effects, especially in patients with gross water retention in the Volhard dilution test. In the majority of cases, however, subjective relief was more evident than a decrease in objective measurements. I wrote[2]:

> "The fact that the origin of a number of cases of primary glaucoma can be traced to tissue hydration, points to the therapeutic effect of dehydrating measures.... This hint should be checked by oculists, since it may serve as a supporting measure in situations in which acute action on the increased intraocular pressure is required."

Jerusalem, Israel. HERMAN ZONDEK.

1. *Schweiz. med. Wschr.* 1953, **83**, 1208.
2. Zondek, H., Wolfsohn, G. *Amer. J. Ophthalmol.* 1947, **30**, 596.
3. Friedenwald, J. S. *Arch. Path.* 1936, **16**, 65.

TEACHING DEAF CHILDREN

SIR,—I welcome Mr. Owen's remarks (June 25) when he says that the best contribution doctors can make to the future educational progress of deaf children is to use and improve the existing facilities for the early diagnosis of deafness and the degree of deafness, and then to push the appropriate authorities into providing the necessary special educational treatment as soon as possible.

I disagree most emphatically with him when he ventures into the educational field and makes the surprising and dogmatic assertion that in suitable conditions, the parents of the deaf child "can give more help by home training under the guidance of a teacher of the deaf than can be given to the child in a nursery school." This is so completely at variance with the experience of this and other nursery schools for deaf children that I feel I must deal with it at some length in order to avoid the possibility of yet another misconception being fostered concerning the education of these children.

In the past two years we have met over thirty children from a variety of home backgrounds, including those where the parents have been able to give almost full time to home training, and in several cases where the training had been supplemented by attendance at a normal-hearing school (at the suggestion of the E.N.T. clinic concerned); and, compared with children of similar degrees of deafness and ability and of the same age, who have been in a special nursery school for two terms or more, all the home-trained children were educationally backward in speech, lip-reading, and language. All their parents have made substantially the same comment: "I wish my child had got into school earlier." It is quite a simple issue. Will the deaf child benefit more from full-time guidance by a teacher of the deaf, as compared with the one-hour lesson once a fortnight?

Home training is limited to the few homes where the conditions permit it, and is therefore out of the question for the majority. It takes no account of the emotional relations between the mother and child, such as over-anxiety which can prejudice good home training. It relies too heavily on the hope that the child will be at his best when the fortnightly lesson begins, although the child often has a lengthy journey to make. It relies on the assumption held currently by some E.N.T. clinics that all that is required in these early years is a "talking environment." This is important, but it can be provided in a properly run nursery school and it must go on concurrently with speech training, &c., which is a skilled job requiring a skilled teacher. May I quote Professor Ewing, head of the department of deaf education, University of Manchester, and a world-renowned authority on this subject. In their book, *Speech and the Deaf Child*, published last year, he and Mrs. Ewing said: "It must be emphasised that great as the benefits of attendance at a nursery school are for ordinary children, it is far more important that deaf children should be able to go to nursery schools or classes planned and organised to meet their special needs. In cases in which the parents cannot give home training, a nursery school is the only effective means of preventing deaf children from living through years of wordlessness and dumbness. For children who enjoy the benefits of training in their homes, attendance at a special nursery school is an essential complement to it, without which they cannot achieve intelligible speech."

Mr. Owen shares the commonly held assumption that for a very young child to go to a nursery school has bad psychological consequences. The Nursery School Association of Great Britain has a wealth of published information and actual experience which establishes the opposite. And we, who are a residential and day school, have had only one child fret away from home, and even here there were other and unusual reasons. We find that the most well-adjusted children are those who go home for weekends, not the day children.

I do not deny the essential place of home training, but it is not a substitute for full-time nursery-school teaching.

Nursery School for Deaf Children, Woodford Green, Essex. B. I. INGALL Principal.

RESPIRATORY OBSTRUCTION IN ACUTE LEUKÆMIA

SIR,—The interesting article of Dr. Levison in your issue of June 4 prompts us to report a similar case in whom symptoms were relieved by 6-mercaptopurine.[1]

A 14-year-old boy was admitted to hospital on Feb. 7, 1955, with a history of cough and increasing dyspnœa of three weeks' duration. His colour was good but numerous enlarged lymph-glands were present in the cervical and axillary regions. The liver and spleen were palpable and signs of pleural effusion were present on the right side. Blood examination gave the following result: hæmoglobin 14·7 g. per 100 ml., red cells 5,000,000, platelets 210,000, white cells 24,600 per c.mm. (neutrophils 51%, lymphocytes and lymphoblasts 49%). Sternal bone-marrow showed 78·8% lymphoblasts. X-ray examination of the chest (fig. 1) showed massive enlargement of the mediastinal lymph-glands and a small effusion at the left base.

Treatment with 6-mercaptopurine, 150 mg. daily, was begun on Feb. 11, and by Feb. 24 his symptoms were completely relieved, and the liver, spleen, and lymph-glands were considerably reduced in size. Clinical and hæmatological improvement continued, and by March 4 the chest radiograph (fig. 2) showed a clearing of the pleural effusion and a return of the mediastinal picture almost to normal.

On a daily dose of 50 mg. of 6-mercaptopurine he remained in remission for six weeks when he again presented with extreme dyspnœa, and massive enlargement of the mediastinal glands was again observed radiologically. Improvement followed treatment with 6-mercaptopurine, 150 mg. daily, and corticotrophin (25 I.U. six hourly). Relief was, however, only temporary and when relapse followed towards the end of May he was found to be completely unresponsive to further treatment and a rapid downhill course followed.

General Infirmary, Leeds.

J. R. H. TOWERS
J. R. FOUNTAIN.

1. Fountain, J. R. *Brit. med. J.* 1955, i, 1119.

Fig. 1—Enlargement of mediastinal glands and small effusion at left base.

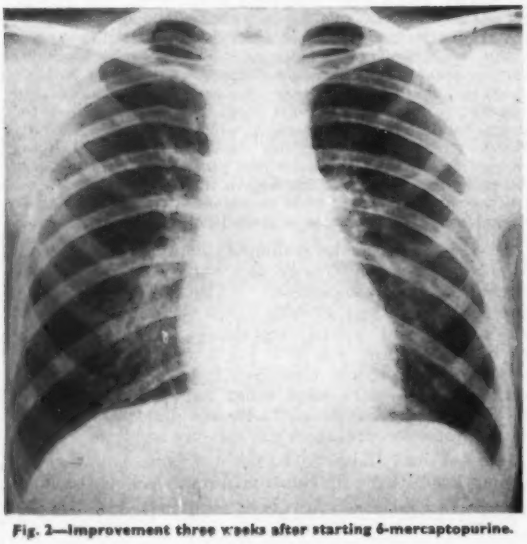


Fig. 2—Improvement three weeks after starting 6-mercaptopurine.

TREATMENT OF CONSTIPATION

SIR,—Severely constipated children who do not fall into one or other category of megacolon constitute a troublesome therapeutic problem. For the past eighteen months we have treated the most intractable cases of this type by internal anal sphincterotomy, with promising results. Pending a report on a follow-up over a period of years, an interim letter may be of interest to those who have to grapple with the practical aspect of this problem.

The specific points Dr. Hinden, the pædiatric consultant, and myself set out to collate have not shown any particular environmental factor to be of significance. Onset has usually been three to six months after birth and most of the patients have been girls. In all cases selected for this treatment the pattern has been much the same—bowels opened every six or seven days usually with an enema. Stools have not as a rule been constipated and sometimes have been surprisingly soft.

Management has been as follows:

The child is admitted to hospital for observation and investigation by barium enema, &c. The degree of constipation is assessed and then a laxative diet is given but no aperient. This includes black molasses treacle, said to contain acetylcholine, prune paste, all-bran, mixed fruit, wholemeal bread, and as much fluid as the child will take. If this régime has no effect in two weeks, the inferior band of unstriped anal sphincteric muscle is divided under general anæsthesia. The operation is performed in a few minutes and is followed by no discomfort whatsoever. The desired effect does not appear to be obtained if the voluntary muscle of the external sphincter is sectioned.

In most cases the result is immediate and even dramatic. The sister of the ward is emphatic that mental outlook and physical condition improves noticeably. The follow-up shows that although there is a falling off in some cases to a two-day or three-day rhythm the majority maintain a daily bowel action.

It may not be out of place to conclude with a word about constipation in the adult who is, after all, the child writ large. Hardly ever do we fail to cure an adult of the purgative habit and restore normal bowl action by a modification in diet along the lines already described. For the most severe cases exercises and abdominal massage are of real value and the best agent for the latter purpose is one of the rubber types of rollers commonly advertised for obesity. Thus, in my experience, the great majority of cases of constipation are amenable to a rational form of re-education that is very little trouble to anyone. If we imagine these simple measures practised on a national scale (and this would not be construed as threatening the freedom to be constipated) the £70 million quoted recently as the annual expenditure on aperients might well be diverted into a more useful channel than the lavatory pan. And even though the philosophically minded might adduce arguments to show that there would not necessarily be any greater usefulness in the likely alternative diversions of this vast sum of money, and that the

pursuits of those who like to cleanse their colons with compound or clyster are harmless enough, it must still be remembered that there are the truly constipated. These people do in fact suffer miseries and are most grateful for advice which frees them from the necessity of taking ever-increasing doses of the latest proprietary intestinal irritant.

Whipps Cross Hospital, London, E.11. D. LANG STEVENSON.

BY ANY OTHER NAME

SIR,—Since Fletcher and Oldham's studies,[1] it is now generally accepted in the radiology of pneumoconiosis that two, three, or more readings of each chest film are necessary, and we agree with the conclusion in your leader of June 18 that "whatever the purpose of the examination and whatever the size of the film . . . the radiograph should preferably be read by two observers."

You point out also with regard to the detection of pneumoconiosis that the suitability of small films can be proved only by an experiment involving large numbers. In an experiment which we have already reported elsewhere,[2] large (15 × 12 in.), 4 × 5 in., and 70 mm. chest radiographs were taken of each of 139 coalminers. Three viewers independently classified each film three times as category 0 (normal), 1, 2, 3, or P.M.F. (progressive massive fibrosis). 70 mm. film classifications were on the average 0·6 categories lower, and 4 × 5 in. film classifications a whole category lower, than the large film classifications. All viewers gave the same average category when reading large films. They did not all agree on the average category, however, when using either of the smaller sizes of film. A measure of consistency of interpretation also showed the large film to be better. We conclude that the two miniature sizes do not compare favourably with the standard large film for the classification of miners' pneumoconiosis.

Nuffield Department of Industrial Health, University of Durham, Newcastle upon Tyne. R. I. MCCALLUM D. J. NEWELL.

IDIOPATHIC GRANULAR PROCTITIS

SIR,—I was much intrigued and not a little surprised by Dr. C. F. J. Cropper's article with this title in your issue of June 18. I was intrigued because he gave a very exact description of the essential lesion of intestinal spirochætosis—to wit the "strawberry lesion," as I have termed it—and its locations in the large bowel.

The *Journal of Clinical Pathology* (1953, **6**, 327) contains an admirable summary of a paper on this subject, amply illustrated with lantern-slides and coloured plates, which I read to some 200 pathologists in London on Oct. 1, 1953. I have been unwilling to publish full details, for I have yet to find an Editor who will accept my request for one or more coloured plates, without which the essential lesion cannot be appreciated. But I hope to read a more lengthy paper to a wider audience, including some clinicians, next year.

The syndrome which Dr. Cropper describes accords identically with my findings in some 50 cases collected during nine years. In children it is sometimes severe, simulating dysentery, and a film from the stools, stained by Fontana's silver impregnation method, will show both spirochætes and fusiform bacilli in enormous numbers (over 100 per field). In adults the syndrome is chronic with exacerbations of explosive diarrhœa, often with melæna.

I well recollect a young soldier, invalided from Germany with unexplained melæna, who had been thoroughly investigated by X rays with negative results and who proved to have this infection both in the throat and in the bowel (when swabbed and sigmoidoscoped). The condition cleared up completely after two ten-day courses of oral acetarsol, which is a specific cure, together with vitamin C, in which these patients are usually deficient.

There are two types—"primary" and "secondary." The former are pure Vincent-fusiform infections, and the latter follow some previous dysentery (usually amœbic) or even a neoplasm of the bowel. Dr. Cropper's cases were mostly "secondary."

He states that published reports on idiopathic (I call it "specific") granular proctitis are surprisingly few; but I can assure him that this infection can be traced back as far as 1884 when Escherich found spirochætes, secondary to cholera, in the dejecta. David Smith, in America, gave an excellent description in his book on spirochætosis in the human body, with an account of feeding experiments in guineapigs which produced Vincent ulcers in the cæcum.

The reason why this condition has so long been lying under our noses unrecognised is simply that pathologists do not look for spirochætes in the stools. They can be seen by an expert in simple gram-stained films, but they hit you in the eye in a silver preparation. But it must be very thin. A swab from the bowel lesion, Dr. Cropper will find, is rewarding if stained correctly.

Eastbourne. A. G. SHERA.

THE TREATMENT OF ECLAMPSIA

SIR,—The interesting article by Dr. Bryce-Smith and Mr. Williams (June 18) prompts me to record two further cases of eclampsia treated by spinal epidural block, especially as an oxytocin drip, suggested in the article, was used in one case. Unfortunately, it did not have the expected satisfactory outcome.

CASE 1.—A primigravida, aged 32, had twelve days' inpatient treatment for pre-eclampsia at thirty-five weeks and was readmitted one week before the expected date of delivery with blood-pressure 150/105 mm. Hg. After three days' rest a surgical induction was performed but in spite of this regular contractions were not established for forty-eight hours. After becoming four fingers dilated, the cervix did not dilate further, and the blood-pressure rose steadily over the next fifteen hours reaching 200/130, when two fits occurred. She was given morphine (gr. 1/4) and 100 ml. of 50% dextrose solution intravenously after the first fit, and the pressure fell to 170/110. Two hours later a lumbar epidural block was performed with 25 ml. of 1% lignocaine. Anæsthesia developed up to T10 and the pressure dropped to 100/60 when methedrine (10 mg. intramuscularly) was given to prevent any further fall. The uterine contractions had now almost ceased but the patient was greatly improved and quite coöperative. After one hour the blood-pressure was 115/80 and an oxytocin drip was commenced with immediate re-starting of uterine contractions. An unexpected result was that the blood-pressure rose and fell with alterations of the rate of drip, suggesting that there was some contamination with the posterior pituitary vasopressor. The blood-pressure finally settled at 150/110. In spite of good contractions the cervix still remained at four fingers. The anæsthesia wore off after two hours, but as the blood-pressure did not rise no further lignocaine was given. Four and a half hours after the start of the oxytocin drip the fœtal heart ceased, and as the labour had not progressed the drip was stopped. A further eight hours passed before forceps delivery could be attempted. Under general anæsthesia a contraction ring was found to be present, and the dead fœtus was extracted with difficulty. Six hours later the blood-pressure was still 150/110. Recovery was uneventful.

CASE 2.—A primigravida, aged 25, was being delivered at home. Two and a half hours after rupture of the membranes a fit occurred and the blood-pressure was found to be 160/110. Two hours later there was a further fit just following admission to hospital. 200 ml. of 2·5% bromethol was given per rectum, but the pressure remained high at 180/40. A lumbar epidural block was performed with 30 ml. of 1·25% lignocaine, and the pressure fell steadily to 150/115. From being almost comatose the patient became reactive and answered questions. As the cervix was fully dilated forceps delivery was performed forthwith, no further anæsthesia being required. The baby cried immediately it was delivered, and was in good condition.

1. Fletcher, C. M., Oldham, P. D. *Brit. J. industr. Med.* 1949, **6**, 168; *Ibid*, 1951, **8**, 138.
2. Newell, D. J., McCallum, R. I. *J. Fac. Radiol.* 1954, **6**, 67.

Within one hour the mother's blood-pressure was 130/90, where it remained.

A method of continuous epidural block was not needed in either of these cases. It should be remembered that by controlling the blood-pressure the dangers of cerebral œdema are avoided, but the toxæmia still persists with its deleterious effects on the fœtus and will not disappear until the uterus is emptied. Speaking as an anæsthetist it seems to me that the correct course is to establish epidural block and, taking advantage of the greatly improved condition of the mother, to proceed, without delay, to cæsarean section (or forceps delivery if the cervix is fully dilated). No further anæsthesia would be required, and a high fœtal-salvage rate should be achieved. The danger of postpartum fits could be prevented by continuing the block for some hours after operation. The difficulties in maintaining a block for several days are well illustrated in the article by Dr. Bryce-Smith and Mr. Williams, and could be obviated by early cæsarean section. The opinion of those better qualified to speak obstetrically would be of great interest.

Both these cases were under the care of Dr. W. Frame Flint, to whom I am grateful for permission to publish.

Kirkcaldy General Hospital, Fife. D. B. SCOTT.

DIAPHRAGMATIC RUPTURE

SIR,—I found the articles by Mr. Sinha and Dr. Hamdi and Dr. Sturdy and your annotation (May 14) most interesting. In the ætiology of this condition there is a point which needs to be explained. Although sudden increase of intra-abdominal pressure may cause diaphragmatic rupture, the rupture is due to reflex contraction of the diaphragm and abdominal muscles, and the primary cause is sudden diaphragmatic contraction and not continuation of violence. This is one reason why diaphragmatic rupture due to non-penetrating injury is so easily overlooked.

Istanbul, Turkey. IMRAN HATIBOĞLU.

STERILISATION OF BLANKETS

SIR,—In his letter of June 25 Dr. Marsh suggests that the use of 'Fixanol C' for the sterilisation of blankets does not have the disadvantages to which we drew attention in our article. He claims that fixanol does not have an unpleasant odour and that it does not stain the blankets. The first point is, of course, a matter of opinion, but in any case we would prefer a substance used for this purpose to be odourless. On the second point, Dr. H. F. Barnard,[1] who described the use of fixanol C in 1952, has since told one of us that after its prolonged use there is definite hardening and brown discoloration of the blankets. As far as solubility is concerned we did not, as Dr. Marsh suggests, say in our paper that fixanol C is insoluble in water. We said, and he confirms, that it dissolves with difficulty. Thus, to make a convenient concentrated stock solution, vigorous boiling is necessary, involving more trouble than would be readily accepted by the laundry staff. We did try adding solid fixanol C directly to the water in the washing-machine but found that it formed a brown glutinous mass which remained in the bottom of the container or adhered to the blankets with which it happened to come in contact.

'Cirrasol OD' is without these disadvantages, and since as a disinfectant it is just as efficient as fixanol we think that it is to be preferred. Incidentally, the article by Dr. Marsh and Dr. Rodway refers throughout to fixanol B, whilst in his letter Dr. Marsh refers to fixanol C. We are not sure, therefore, with which substance his experiments were performed.

We have again read the article by Dr. Marsh and Dr. Rodway and cannot find the reference, which Dr. Marsh mentions in his letter, to the action of soap in antagonising the bactericidal effects of quaternary ammonium compounds. This, of course, is an important and well-known phenomenon to which attention should be drawn. It was, as far as we know, first mentioned by Vaughn and his colleagues [2] in 1948.

General Hospital, Middlesbrough. ROBERT BLOWERS
K. R. WALLACE.

MENTAL RETARDATION

SIR,—No-one could disagree with Dr. Alford's eminently sensible and balanced article (June 18) on the mentally retarded child, but as the mother of such a child I read it with increasing sadness. The stern reality which faces the parent of a mentally defective child is, I regret to say, very much removed from the desirable picture of what ought to be, painted by Dr. Alford.

The legacy of the past has engendered in the minds of most people, including very often the medical profession and the education authorities, an attitude of hopelessness towards these children, with the consequence that provision for their training and welfare is quite inadequate. One is lucky indeed if one succeeds in placing a child in a special school or occupation centre, because there are neither the places to send them nor the staff to teach them when they do get there. One estimate puts the number of children awaiting entry into such schools at 25,000. Meanwhile they deteriorate at home and the parents are left literally alone to tackle the problem.

I am inclined to think that Dr. Alford is rather over-emphasising the parents' sense of guilt. A heavy sense of responsibility one naturally feels, but I would say the predominant emotion is undoubtedly anxiety. The instinctive reaction of any normal mother to the knowledge that her child is handicapped is protective. It is when it is borne upon her that our society is simply not geared to cope with the problem of these children, and that because of this they are bound to suffer, that she herself becomes acutely anxious and unhappy. I well remember the words of the psychiatrist who talked to me about my small son and who said "unfortunately he is normal enough to know he is not normal." When I said despairingly that I thought the child would be better dead he agreed with me!

May I underline Dr. Alford's comments on the importance of the way in which parents are told of their child's disability by relating without comment how I myself was told. I first became worried about the child when at the age of 2½ he still did not talk. I was referred to the children's department of a London teaching hospital, where I saw a consultant physician who, in the space of not more than a few minutes, and in the presence of a group of students, informed me quite bluntly that the child was mentally defective. He added that it was pointless for me to be burdened with him and that he would arrange for his removal to an institution, although this would take some time because of the long waiting-lists. I picked up the child in my arms, and quite unable to utter a word I left the hospital. To this day I do not remember how I got home; the shock was so great that I have a complete amnesia of just about three hours.

Cambridge. ANNE BENNETT.

SIR,—May I support Dr. Cargill's contention (June 25) that little useful purpose is served by classification of children into ineducable on the one hand and educationally subnormal on the other, the former involving exclusion from the educational framework, notification to the mental health authority, and categorisation as "defective."

1. *Brit. med. J.* 1952, i, 21.

2. Vaughn, T. H., Sotier, A. L., Hill, E. F., Simpson, J. E., Lee, W. M. *Industr. Engng. Chem.* 1948, 40, 2054.

It is of interest in this connection that in Glasgow, where I practised some years ago, the term "special" has been removed from "special school" as applied to educational establishments for children whose rate of maturation is slower than the average. Further, where a child's mental growth rendered him unsuitable for school, he could go to an occupation centre on the completion alone of a statutory "schedule," classification as a defective being required only on admission to an institution.

For my part, I should like to see occupation centres receiving the designation of "schools." If the function of education is to nurture, activate, or stimulate the maturation and differentiation of the individual child, then, in so far as the stimulation provided in occupation centres is articulated and keeps pace with the individual child's inner drives and tensions and the manifold lines of differentiation along which his mental growth is developing, the occupation centre is educative in the true sense of that word.

In this connection, mechanistic psychology still blinds us to the realisation that the learning of the child is not a function of a cognitive "faculty" but is essentially integrated with his social and emotional behaviour, and derives its drives from social and emotional experiences. That is why too-premature classification of a child under any form of "handicap" is a serious error, especially where it recommends removal from those intimate emotional and social experiences upon which his learning depends in the earliest years (and which has nothing to do with the 3 Rs).

There is more than a grain of truth in the insight of the parents of children with intelligence quotients of 40 or 50 that their mental condition cannot be adequately summarised in a simple formula. Terms like "mental defect" and "intelligence quotient" are themselves mechanistic and fatalistic and not in accord with the dynamic psychology of today.

Maturation and differentiation of brain patterns is the counterpart in the individual of phylogenetic evolution, and is "replete with surprises." It does not allow of prediction of behaviour in one context to that in another, or of prediction from day to day except within the widest limits and only in exceptional cases—e.g., of gross brain damage. As Wheeler, the exponent of the *Gestalt* psychology in America, has pointed out, the so-called constancy of the intelligence quotient depends largely upon the fact that the environmental context for most children remains relatively constant and invariable throughout their school life.

D. JACKSON
County Psychiatrist,
Perranporth, Cornwall. Cornwall County Council.

METABOLISM OF CANCER CELLS

SIR,—There are certain features of cancer behaviour which seem to me to have a possible common explanation, based on the work of Warburg.[1] This work showed that the cancer cell is inclined to depend for its energy on the process of glycolysis without oxygen utilisation, even when oxygen is available. As a result lactic acid is produced as a chemical end-product. If this is accepted the question comes to mind whether the cancer cell is sensitive to the local accumulation or dissipation of this metabolic end-product. There are some aspects of cancer behaviour which suggest that such a sensitivity may exist.

(1) *Distribution of Cancer Metastases.*—It is a well-known and unexplained fact that cancerous emboli take root and flourish in some tissues, whereas in other tissues they die. From the point of view of the cancer cell the liver is the most fertile of all soils to land in. Skeletal muscle, on the other hand, to the cancer cell is a vast desert. Now the liver and skeletal muscle are the chief sites within the body for, respectively, the disposal and production of lactic acid. In the liver, therefore, the cancer cell finds itself in an environment where an important end-product of its energy metabolism is rapidly dissipated. In skeletal muscle, however, the cancer cell finds itself in surroundings already polluted by one of its own metabolic end-products—i.e., lactic acid. From this point of view it is also interesting to contrast the capacity of cardiac muscle to nourish the cancer cell with that of skeletal muscle. The heart not infrequently harbours cancerous metastases, and the heart also favours lactic acid as a fuel.

(2) *Effect of Vitamin-B_1 Deficiency on Cancer Growth.*—In laboratory animals it has been shown that induced vitamin-B_1 deficiency has a specific inhibitory effect on the growth of cancers. One of the effects of such a deficiency is to cause an accumulation of pyruvic and lactic acids in the body. Again the cancer cell finds itself in a polluted environment.

I do not know of any writings in which cancer behaviour has been regarded from this aspect or of any work which has been done, based on a similar hypothesis. I realise that this hypothesis is probably explodable from the armchair without the necessity for further investigation. However, the ideas are of interest to me and having no facilities for carrying out the famous Hunterian dictum, I submit them for consideration.

Sydney. J. W. GRAHAM.

1. Warburg, O. The Metabolism of Tumours. London, 1930.

COWPOX IN MAN

SIR,—Since the publication of my article on this subject (April 9) my statement concerning the nursery rhyme "Where are you going to my pretty maid?" has been challenged. In the article I suggested that the rhyme derived from the fact that dairymaids were protected from smallpox by previous infection with cowpox. I have therefore consulted the *Oxford Dictionary of Nursery Rhymes* (Opie 1951) and find that my hypothesis was incorrect; this rhyme is a 19th-century version of an old folk song which is recorded as having been sung as early as 1698 and has since been considerably expurgated for recital in the nursery.

Derby. BERNARD LAURANCE.

QUARANTINE MEASURES IN POLIOMYELITIS

SIR,—We should like to congratulate Dr. Agerholm (June 25) on her intuitive approach to the epidemiology of poliomyelitis, and can only look forward to the day when her ingenious hypothesis will have a chance of being put to experiment.

Her hypothesis that the spread of paralytic poliomyelitis in civilised countries is mediated principally by pharyngeal carriers, while intestinal transmission is negligible, rests on evidence of the following kind. The incubation period of poliomyelitis is usually taken as 4–30 days; studies of presumed chains of infection suggest a possible incubation period of 10–14 days; poliomyelitis virus can be isolated from the blood from about 3 days before onset of symptoms to about 2 days after onset, from the pharynx over roughly the same period, and from the fæces from the same time (or earlier) for up to 3–4 months; *therefore* pharyngeal spread is the important method of transmitting paralytic poliomyelitis. The argument seems to us to require a few more facts and a little logic to sustain it.

In the absence of direct evidence which could prove or disprove Dr. Agerholm's hypothesis, we must fall back on the well-established facts in the epidemiology of poliomyelitis. The high rate of infection in countries of poor sanitation where paralytic cases after infancy are virtually unknown amongst native populations, the high risk of paralytic disease to those from civilised countries when they visit such underdeveloped countries (e.g., severe epidemics of paralytic poliomyelitis among British and American troops in the Middle East), and the high summer incidence of the disease throughout the world, all point to the importance of fæcal transmission in the spread of paralytic poliomyelitis. Moreover, viruses isolated from the pharynx and fæces have never been shown to differ in virulence.

In the light of available evidence, we must side with the W.H.O. expert committee on poliomyelitis and the Ministry of Health in this country in declining to take the responsibility of recommending quarantining the pharynx and leaving the fæces to take care of itself.

Virus Reference Laboratory, Central Public Health Laboratory, London, N.W.9. A. P. GOFFE
EDITH M. PARFITT.

PRECIPITATION OF SODIUM URATE IN VITRO

SIR,—The addition of uric acid to a solution containing 2 ml. of a 20% aqueous solution of sodium *p*-aminosalicylic acid (P.A.S.) and 2 ml. of an aqueous solution of 0·1 g. of D(+)glucosamine hydrochloride results in the dissolution of the added uric acid on standing, with consequent precipitation of sodium urate. The amount of uric acid so dissolved was up to 0·25 g.

It has been observed repeatedly that the administration of sodium P.A.S. to gouty patients precipitated an acute gouty crisis with marked exacerbation of articular symptoms.

It is probable that the reaction described above, and discovered recently, may illustrate in vitro the biological precipitation of sodium urate in the tissues.

Woodville South, South Australia. MICHEL BROUS.

Public Health

Toxic Chemicals in Agriculture

THE third report[1] of a working party, under the chairmanship of Prof. S. Zuckerman, F.R.S., on precautionary measures against toxic chemicals used in agriculture has just been published. It deals with the dangers to the natural flora and fauna of the countryside that may arise from the use of toxic chemicals in agriculture, and the precautions to be taken in their use. The dangers to farm stock and bees are also considered. The working party find that in a normal season in Britain the number of casualties to wild birds and animals due to spraying is not particularly high compared with other causes of death, despite the increasing use of some of the newer chemicals—e.g., organic phosphorus compounds. In late 1952 when there were a number of casualties to wild birds and animals in fields sprayed with these insecticides, the combination of circumstances which resulted in these casualties was exceptional and they are not likely to recur frequently. The working party do not consider that further legislation is needed at present. But they note serious gaps in the knowledge of the subject, and recommend that the terms of reference of the interdepartmental advisory committee, set up in conformity with the recommendations of the second report of the working party, should keep under review the risks to wild life arising from the use of toxic chemicals in agriculture.

Because of a dearth of well-documented evidence, the working party arranged for some small-scale field experiments to ascertain the effect of spraying crops on the bird, mammal, and insect life of the area. The results of these experiments reinforced the working party's view that further research was necessary. Many of the animal casualties that have occurred have arisen from a lack of care and coöperation. The working party emphasise the importance of the precautionary measures, indicated in the report, for spraying contractors, farmers, growers, and bee-keepers.

Epidemic Vomiting in Exeter

There was an outbreak of vomiting with diarrhœa in a junior mixed school of 303 children in Exeter, starting on June 8 when 30 children and 1 teacher in various classes fell ill, most of them during school.

The following day 25 children, and the next day 18, fell ill. With the dispersal of the school for the weekend the main epidemic was stopped, 2 children only being ill during the weekend and none during the earlier part of the week, though another 2 children had similar symptoms on June 16. There were several secondary cases among families of the children. Vomiting was the presenting symptom in 47 of the cases, and in 14 of them it was accompanied by diarrhœa. The others complained only of nausea or of abdominal pain or headache. Only 5 had diarrhœa as the sole symptom.

3 of the kitchen staff developed similar symptoms, 2 on June 9 and 1 on June 10. The stools of all 5 kitchen staff were examined and no pathogens found. Only in 2 of the children was it possible to have the stools examined and they both showed no pathogens. No specimen of vomit could be obtained for examination. Some of the adults suffered severely from prostration, but in all cases the illness was of very short duration. The children were not severely ill, and the duration of symptoms was for a maximum of twenty-four hours.

About half the children did not eat dinners in school. The kitchen also supplied the infant school, in which there were only a few cases secondary to older children in the junior school. The kitchen staff did not have symptoms until the second day of the outbreak.

The cause was probably a virus of the epidemic-vomiting type. The pattern of the outbreak and the occurrence of secondary cases in the homes suggest a very short incubation period, probably about twenty-four hours.

Smoking in the United States

The United States Census Bureau has reported that 1½ million Americans have given up cigarette-smoking in the past eighteen months.[1] This figure is based on a sample of about 40,000 people interviewed by the bureau for the National Cancer Institute. The full results of the inquiry will not be published for several months, but some preliminary details have been given.

Of those who stopped smoking cigarettes, 1 million were men and ½ million were women. Most of them were under 45. Of 38 million still smoking in the United States, 25 million were men and 13 million were women. About 4 million men cigarette-smokers smoke less than 10 a day, and ½ million smoke more than 40 a day. The majority smoke between 10 and 20 a day. 3½ million American men smoke a pipe regularly and 4½ million smoke one occasionally. Out of the total adult male population of 50 million, about 34 million are estimated to be either regular or occasional smokers. About two-thirds started smoking before the age of 20.

Appointments

BICKFORD, B. J., M.B. Lond., F.R.C.S.: consultant cardiac surgeon, Royal Liverpool Children's Hospital.
CHURCHILL-DAVIDSON, H. C., M.D. Camb., D.A.: anæsthetist (consultant), St. Thomas's Hospital, London.
FLEMINGER, J. J., M.D. Camb., M.R.C.P., D.P.M.: asst. physician, department of psychological medicine, Guy's Hospital, London.
JOHNS, R. I. J., M.R.C.S.: medical officer, city of Manchester transport department.
NEELY, R. A., M.D. Belf.: whole-time consultant clinical pathologist, Waveney Hospital, Ballymena.
PHILLIPS, R. M., M.D. Lond.: part-time consultant psychiatrist, St. Edward's Hospital, Cheddleton, and City General Hospital, Stoke-on-Trent.
WOOLF, D. L., M.R.C.S., D.PHYS.MED.: part-time consultant in physical medicine, Cerebral Palsy Unit, Stevens Road, Ilford.

Appointed Factory Doctors:

DINGWALL, R. C. MACDONALD, M.B. Aberd.: Peterhead, Aberdeenshire.
KERSHAW, K. C., M.R.C.S.: Tattenhall, Cheshire.
MIDDLEMISS, J. L., M.R.C.S.: Bellingham, Northumberland.
ORR, JOHN, M.B. Edin., F.R.C.S.: Stranraer, Wigtonshire.

Colonial Appointments:

BERLIN, H. W., M.D.: district M.O., St. Lucia.
BRADBURY, E., M.A., B.CH.: A.D.M.S., Sierra Leone.
COHEN, R. I., F.R.C.S.: surgeon specialist, Fiji.
FRASER, N. D., M.B. Lpool: M.O., Uganda.
HEATH, K. I. M., M.B. Belf.: junior hospital M.O., Leeward Islands.
HORWOOD, D. J. C., M.R.C.S.: M.O., Uganda.
IRVING, J. K., M.B. Lond.: M.O., anæsthetist, Trinidad.
LINSELL, C. A., M.B. Lond.: pathologist, Kenya.
MCLEAN, C. M., M.B., D.O.M.S., D.O.: specialist ophthalmologist, ministry of health, Gold Coast.
SLATTERY, M. F. X., M.D.: S.M.O., St. Vincent.
VERRIER, W. L. I., M.R.C.S.: S.M.O., Fiji.
WALKER, A. J., M.B. Lond., D.D.M.S., Kenya.

1. Toxic Chemicals in Agriculture—Risks to Wild Life. H.M. Stationery Office. 1s. 6d.

1. *New York Times*, June 22, 1955.

Obituary

STUART IAN ALEXANDER LAIDLAW

M.D., B.L., B.Sc. Glasg., F.R.F.P.S.

THE corporation of Glasgow, and indeed the health services of Scotland, suffered a severe loss in the death on June 24 of Dr. Stuart Laidlaw at the age of 53. Dr. Laidlaw succeeded Sir Alexander Macgregor nearly ten years ago as medical officer of health for the city and had already distinguished himself by able administration and a wide view of his duties.

He was born in Glasgow but spent his early years in London, returning to Glasgow, however, for his academic career. At the university he gained many distinctions and graduated successively in science, medicine, and law, and later obtained diplomas in public health and public administration. In 1929, three years after he qualified, he entered the public-health department of Glasgow. From the first he took a special interest in tuberculosis, making a close study of both the clinical and the administrative problems. When a colleague visited his office in those days he was sure to be greeted with a friendly and eager discussion about the progress of the campaign against tuberculosis in the West of Scotland. Dr. Laidlaw had an intimate knowledge of the situation and a remarkable acquaintance with patients and their difficulties. He was specially active in introducing new methods of prevention and treatment, and it was he who developed mass radiography for young people as part of the city's campaign against the disease.

[Annan

On his appointment as medical officer of health in 1945 he broadened his interests and took a vigorous part in the effort to improve housing conditions, especially in the elimination of slums which have always been a dark feature of city life in Glasgow. In the same way he became increasingly interested in the development of clinical services to ensure good provision in the new housing areas. He was a keen epidemiologist, and during the outbreak of smallpox in 1950 he devoted himself untiringly to the control of the disease; he was one of those who were honoured by the Priory of Scotland of the Venerable Order of St. John in recognition of his services. His leadership in the care of the aged drew warm approval from many quarters; the University of Glasgow recently awarded him the degree of PH.D. for a careful study of the welfare of people in lodging-houses. The degree was to have been conferred on July 9.

Dr. Laidlaw was a man of great charm of character; he had a way of creating a vivid interest in subjects which he took up; and in presenting his views he always gave a sense of keen personal enthusiasm. His colleagues in the public-health service in Scotland will miss him, for he showed increasing signs of leadership in his profession, and he had played a notable part in organising and developing the post-war services.

Dr. Laidlaw was twice married. His first wife, Dr. Marion Gray, was a fellow student of his and remained in general practice after her marriage. She died in 1950. He married in the following year Miss Caroline Blenkinsop, who survives him with a young son.

Births, Marriages, and Deaths

BIRTHS

DAVIES.—On June 19, at the London Hospital, to Patricia (née Ward), wife of Dr. D. M. Davies—a daughter (Susan Patricia).

Notes and News

A NEW JOURNAL ON ALCOHOLISM

The International Journal on Alcohol and Alcoholism, being the official organ of the International Institute for Research on Problems of Alcohol, has links with the leading workers on this subject in every part of the world—as its distinguished editorial board bears witness. Prof. E. M. Jellinek and Dr. H. Pullar-Strecker, the editors, are much to be congratulated on their first issue, which carries a statistical report on alcoholism in Canada, a note on treatment of chronic alcoholism by intensive electroconvulsive therapy (both in English), and a survey (in German) of drinking habits in Austria, as well as a classified bibliography on disulfiram ('Antabuse') and lists of world publications on alcohol. The chief aim of the editors is to present comprehensive country-by-country surveys of specific problems and achievements, and to sift and correlate work done all over the world—a thoroughly useful programme. They accept articles in five languages—English, French, German, Italian, and Spanish—and give summaries of the gist of each of them in the four languages not used by the contributor.

We wish the new journal a long and useful polyglot career. It is published three times yearly by Blackwell Scientific Publications, Oxford, at 12*s.* 6*d.* per copy or 30*s.* for the annual subscription (post free).

A SCOTTISH MEDICAL JOURNAL

AT meetings last Monday the Royal Medico-Chirurgical Society of Glasgow, the Medico-Chirurgical Society of Edinburgh, and the Edinburgh Obstetrical Society agreed to found jointly a *Scottish Medical Journal*. The new journal will incorporate the *Edinburgh Medical Journal* (which was founded in 1705 and has lately discontinued publication) and the *Glasgow Medical Journal* (founded in 1828).

The journal will be administered by a governing body of twelve, of whom six will represent Glasgow and six Edinburgh. The medical societies in Aberdeen and Dundee are to be asked to nominate observers. The editor will be appointed by the governing body; and a joint committee has unanimously recommended the appointment of Dr. Alexander Brown, of Glasgow.

SOCIAL PSYCHIATRY

A RECEPTION was held in London on June 23 to celebrate the first issue of the *International Journal of Social Psychiatry*.[1]

Lord Webb-Johnson spoke of the influence of social psychiatry during the past twenty years in furthering the welfare of the mentally ill. The therapeutic social club, he pointed out, was helping to prevent mental breakdown among isolated city dwellers, and the day-hospital was affording the full range of modern mental treatment to the mentally ill while allowing them to remain within the community. In both these new forms of treatment the policy of treating the patient in his social setting was vindicated by the therapeutic results.

Dr. Joshua Bierer, who, with Prof. Thomas A. C. Rennie (Cornell University), is joint editor of the new journal, spoke of the development of social psychiatry in this country and abroad. It was hoped that the journal would provide a forum for discussion and interchange of experiences between psychiatrists of all disciplines and in all parts of the world. The patients, too, would be encouraged to contribute their own viewpoint—a practice inaugurated in the first issue.

MEDICAL FILMS

Allergic Diseases in Man (16 mm., sound, colour, 25 minutes) is a new British film on the causes and theory of allergic conditions, and methods of diagnosing and treating them.

It opens with examples of inhalant, contactant, and injectant allergens, and explains by means of excellent animated diagrams the differences between the toxin/antibody reaction and the allergen/antibody reaction. The importance of an exhaustive case-history in investigating possible allergic diseases is stressed, and lists of "typical allergic conditions" and "conditions often allergic in origin" are given. Skin-testing is shown in detail. Methods of reducing allergens in the home are suggested, and the theory of desensitising agents is shown on diagrams. After a sequence devoted to the preparation of desensitising solutions, the incidence of allergic diseases is compared with that of other causes of morbidity.

1. Published quarterly by the Avenue Publishing Company, 9, Fellows-road, London, N.W.3. 25*s.* per annum; 7*s.* 6*d.* per issue.

The film is well made and the subject is presented in an orderly and convincing way. It is available free of charge and should be of particular interest to general practitioners.

Resuscitation of Hypothermic, Supercooled, and Frozen Mammals (16 mm., sound, black-and-white, 17 minutes) presents some recent experiments at the National Institute of Medical Research.

In general shape the presentation suggests a television programme. The film opens with a short introduction by a speaker who first poses the problems to be investigated—how to cool a mammal sufficiently to stop respiration and the heart-beat while allowing full resuscitation on rewarming and what happens if the body-water crystallises—and he then introduces three workers who demonstrate the cooling of a rat until the heart and respiration cease, the magnetron microwave generator and its use for rewarming, and the freezing and resuscitation of a hamster. Finally the speaker suggests the clinical significance of the research and indicates lines of further investigation.

The film is a fascinating record of research in progress, and will be valuable both for workers in other laboratories studying the subject and for future historians of medical research. The investigations are clearly shown, and the commentary by the workers themselves has a rare authority.

University of Cambridge

Dr. J. D. Lever has been appointed a university lecturer in the department of anatomy, and Dr. P. J. Randle a university lecturer in the department of biochemistry.

On June 11 the following degrees were conferred:

M.D.—David Bulmer, Leonhard Haas, H. P. Lambert, C. B. McKerrow, F. R. R. Martin, R. A. Struthers.
M.Chir.—J. O. Robinson.
M.B.—June P. Brady, D. C. L'E. Burges, R. J. Haythornthwaite, Alan Pollard, J. O. Robinson.

University of London

On May 18 the degree of M.D. was awarded to John Fry.

University of Bristol

At recent examinations the following were successful:

M.D.—M. E. M. Herford, Harold Schnieden.
Ch.M.—P. R. Slade.
M.B., Ch.B.—Elizabeth Burge, Joyce E. Moore, Mavis M. Polkinghorne (with second-class honours); G. K. Allwood, Dorothy F. Bate, Jean M. Bebell, Prudence M. Beckingham, H. F. Bolton, M. T. Charleston, Margaret E. Chesterfield, J. P. J. Clarke, Shirley A. Craven, Edith Faierman, F. G. Farrelly, D. J. Foley, J. K. Hartwell, A. J. S. James, Mary T. C. A. Jorro, Janet H. Keevil, P. M. Lambert, Pamela M. Laurence, Penelope A. Leighton, R. G. McCormick, Nancy Mercer, R. E. Midwinter, G. A. Naylor, J. B. Neilson, H. J. L. Nicholls, P. J. Roylance, D. W. Simpson, E. M. Smith, Anne L. Stewart, Edgar Wallace.
D.P.H. (part II).—Margaret M. J. O'Dea, Elizabeth M. Sefton, P. J. Speller, M. D. M. Reilly.

Royal College of Surgeons of England

Faculty of Anæsthetists.—A scientific meeting of the faculty will be held at the college, Lincoln's Inn Fields, London, W.C.2, on Saturday, July 9, at 10.30 A.M. Lord Adrian, O.M., will speak on the protopathic system, Mr. W. Grey Walter, SC.D., on electro-encephalography in the study of brain disease, Dr. B. D. Wyke on neurophysiological aspects of barbiturate narcosis, and Dr. W. Blackwood on the pathogenesis of ischæmic and hæmorrhagic lesions in the brain stem secondary to raised supratentorial intracranial pressure.

Society of Apothecaries of London

At a meeting of the court of assistants on June 21 with Sir Cecil Wakeley, the Master, in the chair, Dr. Redvers Nowell Ironside was elected to the court. The Gillson scholarship in pathology was awarded to Dr. E. A. Wright.

The following were elected to the yeomanry of the society: J. C. P. Grey, W. R. Thrower, H. T. Calvert, R. S. Murley, Paul Mine, T. D. Whittet, H. G. Dowler, R. K. Phillips, J. H. Crosland, Denis Williams, C. S. Nicol, J. H. L. Griffin, Hon. Geoffrey Bridgeman, George Simpson, A. G. Aitchison, J. M. Brown, F. Harwood Stevenson, Ralph Southward.

The following were granted the L.M.S.S.A.:

D. P. Addy, G. M. Fraser, K. A. Huang, F. John, E. de M. Taunton, J. M. Forster, V. J. Jobson.

The following were awarded the diploma of master of midwifery:

D. B. Brown, F. J. Cockersole, S. A. Smith.

Nutrition Society

At a meeting of this society to be held on Friday and Saturday, July 8 and 9, at the Physiology Laboratory, South Parks Road, Oxford, there will be a symposium on the nutritional work of F.A.O., W.H.O., and UNICEF. The speakers will include Dr. Dorolle (Geneva), Dr. W. R. Aykroyd, Dr. R. C. Burgess (Geneva), and Dr. S. Postmus (Rangoon).

Institute of Diseases of the Chest, London

On Wednesday, July 6, at 5 P.M., at this institute, Brompton, S.W.3, Prof. E. A. Boyden, of Minnesota, will give a lecture on the development of the bronchopulmonary segment in the human embryo.

Chinese Red Cross Delegation

On June 24 a reception was held in London, by the Chargé d'Affaires of the People's Republic of China, in honour of the Chinese Red Cross delegation and Madame Li Teh-chuan, president of the Chinese Red Cross Society, now visiting this country.

Middlesex County Medical Society

Dr. T. Rowland Hill will give the John Tate lecture on Wednesday, July 13, at 5.30 P.M. in the Middlesex Guildhall, London, S.W.1. He is to speak on the National Health Service and Its Problems—Lessons Learned Since 1948. All doctors are invited.

Biological Rhythm Congress

This congress will be held in Stockholm from July 15 to 17. The main subjects chosen for discussion are Rhythmical Phenomena in the Nervous System, Cybernetics, and Rhythm and Industrial Medicine. Further particulars may be had from the secretary of the congress, Anatomiska institutionen, Karolinska institutet Solnavägen 1, Stockholm.

Australian Fellowship in Poliomyelitis Research

The British Memorial Fund, which was set up in Victoria by public subscription as a gesture of "loyalty, gratitude and affection" to the British people after the second world war, is offering a fellowship (£A1000) to a doctor whose duties associate him with public-health work in the treatment and aftercare of poliomyelitis in the country districts of England, Scotland, or Wales. Further particulars will be found in our advertisement columns.

Recruitment and Training of Social Workers

The Working Party which has been set up by the Minister of Health and the Secretary of State for Scotland to examine the work, recruitment, and training of social workers in the local authorities' health and welfare services will meet under the chairmanship of Miss Eileen Younghusband. The nine members include: Dr. P. C. McKinlay, general practitioner of Beverley, Yorks, and Prof. A. B. Semple, medical officer of health for Liverpool.

Blood-donors

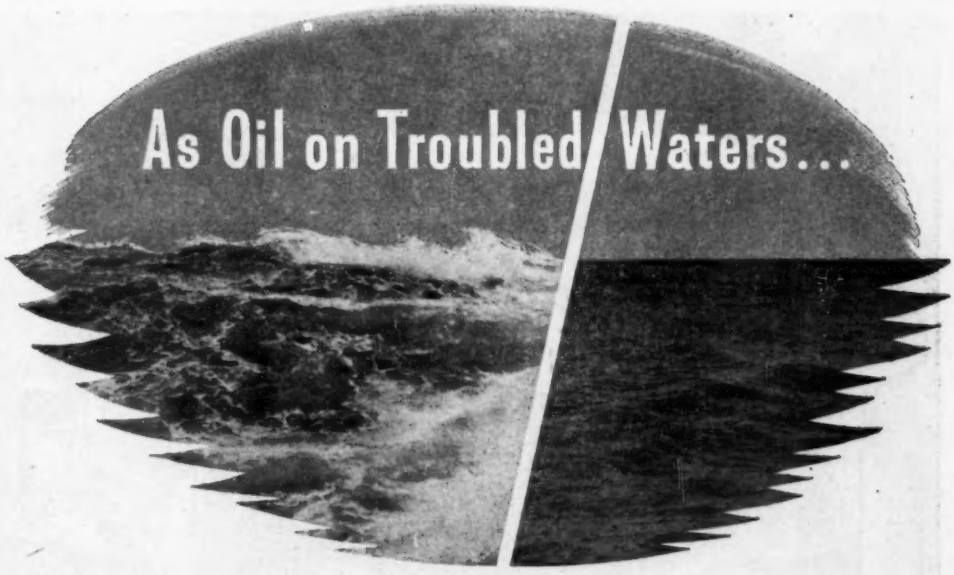
Gifts of blood to hospitals in England and Wales through the National Blood Transfusion Service numbered 700,202 in 1954, compared with 659,674 in 1953 and 669,000 in 1944 (the previous highest total). At the end of last December the total strength of the donors' panel was 540,389—a net increase of nearly 25,000 compared with 1953. The National Blood Transfusion Service needs 650,000 regular donors to make sure that no-one need be asked to give blood more than twice a year, to replace the older donors when they reach the age of 65, and to provide adequate reserves of blood-plasma.

West London Medico-Chirurgical Society

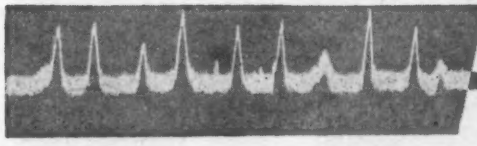
At the annual dinner, on June 23, Sir Arthur Gemmell, P.R.C.O.G., suggested that the society's continued success—it is now in its 73rd year—was due to its close association with the West London Hospital, and to the fact that it had remained a general society. Sir Arthur was proposing The President and The Society; and in his reply the President, Dr. W. R. Thrower, expressed the view that in these days of bustle a medical society would fail unless it performed a definite function. Such societies could survive only if they preserved the humanities of medicine. They were useful in providing a gathering-point for informal exchanges. The President deplored the division between general practitioner and specialist, which, he said, was something quite new. Societies such as the West London could bridge this gap. Dr. Charles Newman spoke with grace and economy of The Guests and Kindred Societies, and Dr. Brian Warren responded. The High Commissioner for New Zealand received on behalf of the society a gavel presented by Dr. Bernard Myers, a former president. Finally the President presented to Sir Russell Brock the triennial gold medal.

CORRIGENDA: On the *contents page* of some copies of last week's issue we wrongly described Dr. Z. A. Leitner as Prof. Z. A. Leitner, F.F.A. R.C.S.

Old People in Welfare Homes.—In our note last week (p. 1335) the fourth sentence should have read: "There had been some 40 deaths at this establishment during the first three months of this year."



... SO IS



'CO-ELORINE'

TRADE MARK

TO THE SPASTIC COLON

A combination of 'ELORINE Chloride', brand Tricyclamol Chloride, a new anticholinergic drug, with 'AMYTAL', for the control of spasm in

PEPTIC ULCER • PYLOROSPASM
GASTRITIS • COLITIS
ACUTE GASTRO—ENTERITIS

Lilly
TRADE MARK

SUPPLIED: In bottles of 25, 100 and 1000 'Pulvules' brand filled capsules.
DOSE: 1–2 'Pulvules' three or four times daily.

ELI LILLY AND COMPANY LIMITED · BASINGSTOKE · ENGLAND

27

USE GOOD BOTTLES

UNITED GLASS BOTTLE MANUFACTURERS LTD

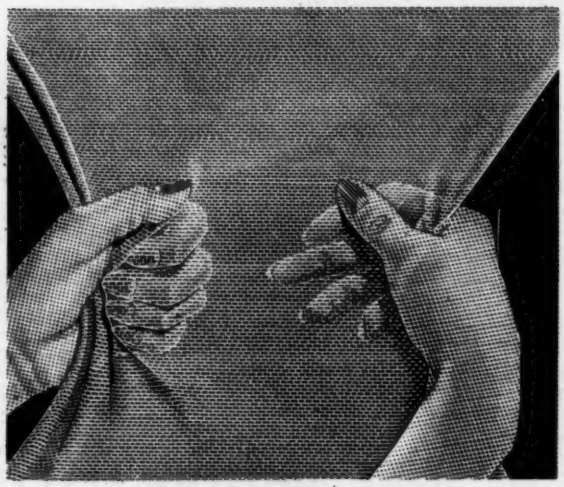
8 LEICESTER STREET, W.C.2

Telephone: Gerrard 8611 (18 lines) *Telegrams:* Unglaboman, Lesquare, London

'I want you to wear a Lastonet stocking'

Lastonet surgical stockings are always made to measure for a perfect fit. The lightweight elastic net stretches in all directions for even support and allows air to come in contact with the skin. The stockings may be prescribed under the National Health Scheme.

Lastonet
ELASTIC
NET STOCKING



LASTONET PRODUCTS LTD, CARN BREA, REDRUTH, CORNWALL

P1

When diet is *important*...

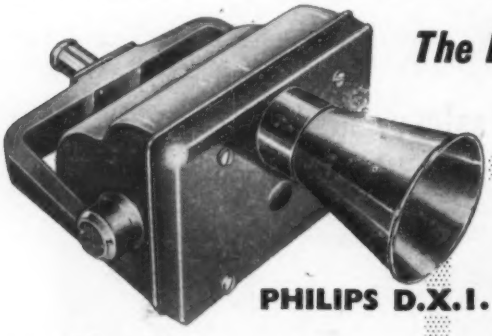
— the Energen Dietary Service can give *immediate* advice and help. Special diets for individual cases can be prepared or standard diet cards for common ailments—replaceable as required—are available in an indexed filing box (as shown here). Personal consultations can be arranged with the Senior Dietitian, and a special 40-page book on specific dietary problems, "Diet and the General Practitioner," will be sent on request. All these services are free of charge to practitioners throughout the United Kingdom. For further details, write or telephone the Secretary,

This Diet Card File is free of charge to practitioners.

ENERGEN DIETARY SERVICE

25a BRYANSTON SQUARE, LONDON, W.1 (AMBassador 9332)

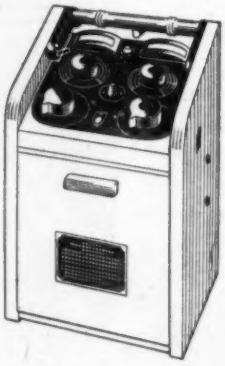
29



The PORTABLE X-ray unit with so many uses

The D.X.1 assembled for use

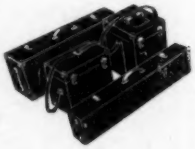
PHILIPS D.X.1.



The D.X.1 portable X-ray unit with its phenomenally high output—85 kV, 15 mA—has a very much wider sphere of application than is usually associated with equipment of its kind.

The control is designed to permit accurate reproduction of the radiographic results even with fluctuating supply mains. The fluoroscopic rating is more than adequate.

You will want to know more of this equipment — which is procurable throughout the world.



The D.X.1 packed for transportation

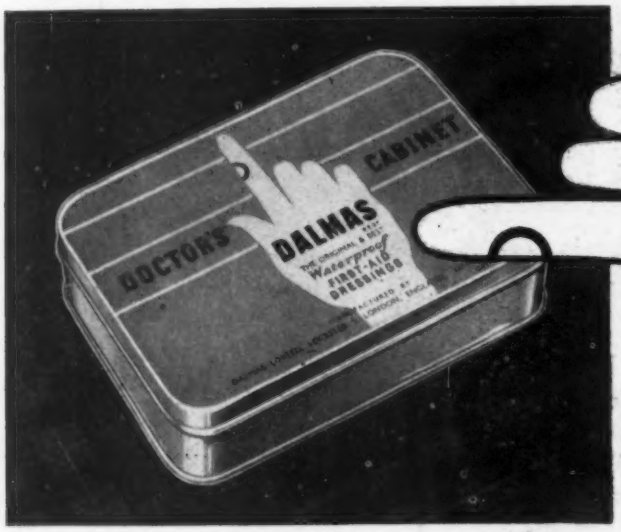
The D.X.1, is on show at the X-ray Centre, Century House

Write or 'phone for further information

PHILIPS ELECTRICAL LTD

X-RAY DIVISION

CENTURY HOUSE · SHAFTESBURY AVENUE · LONDON · WC2 · GERrard 7777 (PXM0111)



180 WATERPROOF dressings in the DALMAS Doctor's Cabinet

DALMAS waterproof dressings provide safe and speedy first-aid for all wounds, cuts and common casualties. Self-adhesive, they are simple to apply and flex with every movement like a second skin. The special Doctor's Cabinet contains 180 dressings in seven sizes and shapes together with a spool of Dalmas Strapping. Fully descriptive literature will be sent on request.

Cabinets 16/8 each. Complete Refills 14/10 each.

DALMAS LIMITED, LEICESTER & LONDON. Established 1823

M3

LUCOZADE as an improved form of glucose therapy

Lucozade combines all the known qualities of glucose with a unique palatability. Hence its unusual versatility — as a revitalising drink, as a means of sustenance when solids cannot be tolerated, and as the ideal answer when the appetite is impaired. Lucozade will be tolerated by the most difficult patient.

LUCOZADE

the sparkling glucose drink

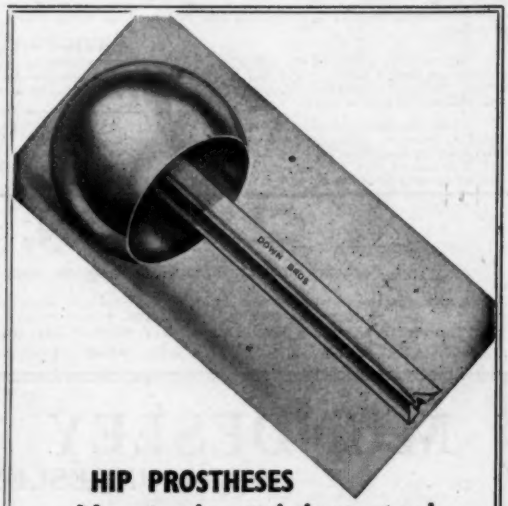
REPLACES LOST ENERGY

You *should bank*

with the

Westminster

Westminster Bank Limited
Head Office: 41 Lothbury
London, E.C.2



HIP PROSTHESES
Non-toxic stainless steel

DOWN BROS. and MAYER & PHELPS LTD.
Surgical Instrument Makers
92-94, Borough High Street, London, S.E.1
and
32-34, New Cavendish Street, London, W.1

H. K. LEWIS'S PUBLICATIONS

READY THIS MONTH

POLIOMYELITIS AND POLIOENCEPHALITIS. By R. A. RUSSELL TAYLOR, Ch.M., F.R.C.S., M.R.C.O.G., late Medical Superintendent and Surgeon, Pinderfields General Hospital, Wakefield, etc. 8½ in. × 5½ in. With 24 Illustrations. **£1 7s. 6d.** net; postage 1s. 1d.

COMMON SKIN DISEASES. By A. C. ROXBURGH, M.D., F.R.C.P., late Consulting Physician for Diseases of the Skin, St. Bartholomew's Hospital, etc. Tenth edition. With 8 Coloured Plates and 215 Illustrations. 8½ in. × 5½ in. **£1 10s. 0d.** net; postage 1s. 3d.

A CLASSIFICATION FOR MEDICAL AND VETERINARY LIBRARIES. By CYRIL C. BARNARD, B.A., F.L.A., F.I.L., Librarian, London School of Hygiene and Tropical Medicine. 10 in. × 7½ in. **£4 4s. 0d.** net.

LONDON: H. K. LEWIS & CO. LTD., 136 GOWER STREET, W.C.1. Telephone: EUSton 4282

ST. ANDREW'S HOSPITAL FOR NERVOUS AND MENTAL DISORDERS

NORTHAMPTON

PRESIDENT: THE EARL SPENCER

MEDICAL SUPERINTENDENT: THOMAS TENNENT, M.D., F.R.C.P., D.P.H., D.P.M.

This Registered Hospital is situated in 130 acres of park and pleasure grounds. Voluntary patients, who are suffering from incipient mental disorders or who wish to prevent recurrent attacks of mental trouble; temporary patients, and certified patients of both sexes are received for treatment. Careful clinical, biochemical, bacteriological, and pathological examinations. Private rooms with special nurses, male or female, in the Hospital or in one of the numerous villas in the grounds of the various branches can be provided.

WANTAGE HOUSE

This is a Reception Hospital in detached grounds with a separate entrance, to which patients can be admitted. It is equipped with all the apparatus for the complete investigation and treatment of Mental and Nervous Disorders by the most modern methods; insulin treatment is available for suitable cases. It contains special departments for hydrotherapy by various methods, including Turkish and Russian baths, the prolonged immersion bath, Vichy Douche, Scotch Douche, Electrical baths, Plombières treatment, etc. There is an Operating Theatre, a Dental Surgery, an X-ray Room, an Ultraviolet Apparatus, and a Department for Diathermy and High-frequency treatment. It also contains Laboratories for biochemical, bacteriological, and pathological research. Psychotherapeutic treatment is employed when indicated.

MOULTON PARK

Two miles from the Main Hospital there are several branch establishments and villas situated in a park and farm of 650 acres. Milk, meat, fruit, and vegetables are supplied to the Hospital from the farm, gardens, and orchards of Moulton Park. Occupational therapy is a feature of this branch, and patients are given every facility for occupying themselves in farming, gardening, and fruit growing.

BRYN-Y-NEUADD HALL

The seaside house of St. Andrew's Hospital is beautifully situated in a park of 330 acres, at Llanfairfechan, amidst the finest scenery in North Wales. On the North-West side of the Estate a mile of sea coast forms the boundary. Patients may visit this branch for a short seaside change or for longer periods. The Hospital has its own private bathing house on the seashore. There is trout-fishing in the park.

At all the branches of the Hospital there are cricket grounds, football and hockey grounds, lawn tennis courts (grass and hard courts), croquet grounds, golf courses, and bowling greens. Ladies and gentlemen have their own gardens, and facilities are provided for handicrafts, such as carpentry, etc.

For terms and further particulars apply to the Medical Superintendent (TELEPHONE: Northampton 4354 (3 lines)), who can be seen in London by appointment.

CLIFFDEN, TEIGNMOUTH

For the early treatment of nervous disorders and patients needing rest and care

A well-appointed House with spacious balconies and extensive views of the South Devon Coast. Beautiful garden and own dairy in 35 acres In the same grounds, **ROWDENS**, a comfortable house with lovely views. Private road to the beach

There is also a charming house, **EBWORTHY, MANATON, DARTMOOR**, situated in 25 acres, 1100 ft. up for bracing moorland air

Resident Physicians—BERTHA M. MULES, M.D., B.S. ANNE S. MULES, M.R.C.S., L.R.C.P *Telephones*—TEIGNMOUTH 289 and 537

MUNDESLEY SANATORIUM

MUNDESLEY, NORFOLK

TERMS FROM 16 GUINEAS WEEKLY (Single Room)
" " 14 " " (Shared Room)
} Immediate vacancies

Medical Superintendents:

E. C. WYNNE-EDWARDS
M.B.(Cantab.), F.R.C.S.(Edin.)

GEORGE H. DAY
M.D.(Cantab.)

For all information apply THE SECRETARY

Telephone: Mundesley 94 and 95 (2 lines)

CHISWICK HOUSE

PINNER, MIDDLESEX

Telephone: PINNER 234

A Private Home for the Treatment and Care of Mental and Nervous Illnesses in both Sexes.

A modern house, 12 miles from Marble Arch, in attractive secluded grounds. Patients treated under Certificate, Temporary or Voluntary status. Modern forms of treatment, including psychotherapy, narco-analysis, modified insulin, occupational therapy, E.C.T., etc.

DOUGLAS MACAULAY, M.D., D.P.M.

HEIGHAM HALL, NORWICH

PRIVATE MENTAL HOME for Nervous and Mental illness. All types of treatment carried out. Accommodation for Alcoholics and Addicts available. Special Geriatric Unit now open. Fees from 6 gns. per week upwards according to requirements.

Apply to Dr. J. A. SMALL Telephone: Norwich 20080

SPRINGFIELD HOUSE

Phone: BEDFORD 3417 Near BEDFORD

For MENTAL CASES (including the aged)

Fees from Eight Guineas per week

For forms of admission, &c., apply to the Resident Physician, CEDRIC W. BOWER.

INTERVIEWS IN LONDON BY APPOINTMENT.

BOWDEN HOUSE

HARROW-ON-THE-HILL, MIDDLESEX

Established in 1911 Tel.: BYRon 1011 & 4772

(Incorporated Association not carried on for profit)

A private clinic for the treatment of the neuroses and nervous disorders by psychotherapy and all modern physical therapies.

Apply: MEDICAL DIRECTOR

THE MEDICAL PROTECTION SOCIETY LIMITED

Over 60 years experience in medical defence and protection

Complete Indemnity granted to members in cases undertaken on their behalf

ANNUAL SUBSCRIPTION: £1 for first three years for newly qualified entrants and £2 thereafter

Full particulars from the Secretary (Dr. Alistair French), Victory House, Leicester Sq., W.C.2. Gerrard 4553 and 4814

Vacancies

ACADEMIC AND EDUCATIONAL SECTION *Page* 35

ANÆSTHETICS

Central Middlesex, N.W.10. Locum Sr. Reg. 38
Hackney, E.9. Sr. H.O. 38
Queen Charlotte's & Chelsea Hosps. P.-t. Cons. 36
St. Leonard's, N.1. Sr. H.O. 38
St. Thomas's, S.E.1. Sr. Reg. .. 39
University College Hosp., W.C.1. Sr. H.O. 39
Woolwich Group H.M.C. Sr. H.O.'s.. 39
Bath. St. Martin's. Sr. H.O. 39
Birmingham R.H.B. Cons. 36
Bishop Auckland Gen. Sr. H.O. .. 40
Bradford. St. Luke's. Sr. H.O. .. 40
Colchester H.M.C. Sr. H.O. 42
Derby. Derbyshire Royal Infy. Sr. H.O. 42
Dudley, Stourbridge & Dist. Sr. H.O. 42
Glasgow Royal Infy. Sr. H.O. .. 42
Halifax. Royal Halifax Infy. Sr. H.O. 43
Leeds A Group H.M.C. Sr. H.O. .. 45
Leeds R.H.B. Locum Regs. 44
Manchester. West Manchester H.M.C. Sr. H.O. 46
Norwich United Hosps. Sr. H.O. .. 47
Nottingham City. Sr. H.O. 46
Nottingham Gen. Sr. H.O. 46
Reading. Royal Berks. Sr. H.O. .. 47
Romford. Rush Green. Sr. H.O. .. 48
Scotland. Northern R.H.B. Sr. H.M.O. 37
Sheffield R.H.B. Sr. Reg. 48
Swansea. Sr. H.O. 49
Winchester. Royal Hants County. H.O. 50

CASUALTY

Hammersmith, West London & St. Mark's, W.12. Sr. H.O. 38
Queen Mary's Hosp. for the East End, E.15. H.O. 38
St. Nicholas, S.E.18. H.O. 39
Wanstead, E.11. Sr. H.O. 39
Bedford Gen. Locum Reg. 39
Bristol United Hosps. Sr. H.O. .. 41
Bromley, Kent. Sr. H.O. 41
Carshalton. St. Helier. Sr. H.O. .. 41
Croydon Gen. Reg. 42
Croydon. Mayday. Sr. H.O. .. 41
Derby. Derbyshire Royal Infy. Sr. H.O. 42
Dudley, Stourbridge & Dist. Sr. H.O.'s 42
Halifax. Royal Halifax Infy. Sr. H.O. 43
Hemel Hempstead. West Herts. Jr. H.M.O. 43
Hitchin Hosps. H.O. 43
Leamington Spa. Warneford Gen. Sr. H.O. 44
Leeds R.H.B. H.O.'s.. 44
North West Met. R.H.B. Sr. Casualty Officer 36
Norwich. Norfolk & Norwich. Sr. H.O. & H.O. 47
Plymouth. South Devon & East Cornwall. Sr. H.O. 47
Romford. Oldchurch. Sr. H.O. .. 48
Slough. Upton. H.O. 49
St. Helens & Dist. H.M.C. Sr. H.O.'s 49
Swindon Hosp. Group. Sr. H.O. .. 49
Watford Peace Mem. H.O. 50
Welsh R.H.B. Locum Reg. 50
Wigan. Royal Albert Edward Infy. Pre-reg. H.O. 50
Windsor King Edward VII. Sr. H.O. 50
Wolverhampton Group. H.O. .. 50

CHEST AND TUBERCULOSIS

Colindale, N.W.9. Reg. 38
West Ham Chest Clinic, E.13. P.-t. Clin. Asst. 39
Brighton. Bevendean. Jr. H.M.O. .. 40
Epping. St. Margaret's. Sr. H.O. .. 42
Halifax. Northowram Hall. Sr. H.O. 43
Manchester R.H.B. Reg. 45
Manchester R.H.B. Sr. H.M.O. .. 36
Redhill & Croydon Group H.M.C. Reg. 47
Sheffield R.H.B. Reg. 48
Weaverham, Cheshire. Heffferston Grange San. Locum Sr. H.O. .. 50
Worcester. Knightwick San. Jr. H.M.O. 50

DERMATOLOGY

Whittington, N.19. P.-t. Clin. Asst. (G.P.) 39
Birmingham Skin. Sr. H.O. or H.O.'s 40
Derby. Derbyshire Royal Infy. Reg. 42
Glasgow. Stobhill Gen. Pre-reg. H.O.'s 42

EAR, NOSE, AND THROAT

Royal National T.N. & E., W. H.O. 38
Birmingham & Midland Ear & Throat. H.O. 40
Birmingham United Hosps. Reg. .. 40
Doncaster Royal Infy. Sr. H.O. .. 42
Manchester R.H.B. Reg. 45
Nottingham Gen. Sr. H.O. 46
Salisbury Gen. Sr. H.O. 48
Scotland. Western R.H.B. Sr. Reg. 48
Shrewsbury Hosp. Group. Reg. .. 48
Stoke-on-Trent. North Staffs Royal Infy. Sr. H.O. 49
Wolverhampton Group. H.O. .. 50

GERIATRICS

Glasgow. Stobhill Gen. Pre-reg. H.O.'s 42
Glasgow. Stobhill Gen. Jr. H.M.O. 42
Halifax. St. John's. Sr. H.O. .. 43
Leeds R.H.B. Locum Sr. H.M.O. .. 36
Manchester. Withington. Sr. H.O.. 45
Rochford, Essex. Gen. Sr. H.O. .. 47

HÆMATOLOGY

Queensland. Red Cross Blood Transfusion Service. Asst. Med. Director 37

INFECTIOUS DISEASES

St. Ann's Gen., N.15. Sr. H.O. .. 39
Cardiff Isolation. Sr. H.O. 41
Oxford United Hosps. Jr. H.M.O.... 47
Plymouth. Scott Isolation. H.O. .. 47
Stockport. Cherry Tree. Sr. H.O .. 49

MEDICINE

Bethnal Green, E.2. H.O. 38
Lambeth, S.E.11. Reg. & H.O. .. 38
Queen Mary's Hosp. for the East End, E.15. Pre-reg. H.O. 38
St. James', S.W.12. H.O. 38
Wanstead, E.11. H.O. 39
Willesden Gen., N.W.10. Reg. .. 39
Wimbledon, S.W.20. H.O. 39
Aylesbury. Stoke Mandeville. H.O. 39
Bath. St. Martin's. Sr. H.O. 39
Bedford Gen. Pre-reg. H.O. 40
Bishop's Stortford & Dist. Sr. H.O. 40
Brighton. New Sussex Hosp. for Women. H.O. 40
Cambridge. Addenbrooke's. H.O.'s 41
Carmarthen. West Wales Gen. H.O. 41
Chester-le-Street. Gen. H.O. 41
Derby City. Pre-reg. H.O. or Sr. H.O. 42
Derby. Derbyshire Royal Infy. Pre-reg. H.O. 42
Dudley, Stourbridge & Dist. Sr. H.O. 42
Durham. Dryburn. H.O. 42
East Anglian R.H.B. Reg. 42
Edgware Gen. H.O. 42
Glasgow. Gartloch. Sr. H.O. .. 43
Gt. Yarmouth & Gorleston Gen. H.O. 43
Haverfordwest. Pembroke County War Mem. H.O. 43
Hertford County. H.O. 43
Isleworth. West Middlesex. Pre-reg. H.O. 44
Leeds R.H.B. Locum Regs. & H.O.'s 44
Liverpool. Sefton Gen. H.O.'s. .. 45
Manchester R.H.B. Reg. 45
Manchester United Hosps. Reg. .. 45
Newmarket Gen. H.O. 46
Norwich. Norfolk & Norwich. H.O.'s 47
Nottingham City. H.O.'s 46
Oxford R.H.B. Sr. Reg. 47
Portsmouth Group H.M.C. Pre-reg. H.O.'s 47
Rochdale & Dist. H.M.C. Sr. H.O. .. 47
Romford. Oldchurch. H.O.'s .. 48
Scotland. Eastern R.H.B. Reg. .. 48
Scotland. South-Eastern R.H.B. Sr. Reg. 48
Scotland. Western R.H.B. P.-t. Cons. 37
Scotland. Western R.H.B. Reg. .. 48
Southampton Gen. Reg. 49
Stafford. Staffordshire Gen. Infy. Pre-reg. H.O. 49
St. Helens & Dist. H.M.C. H.O. .. 49
Stockport & Buxton H.M.C. H.O.'s 49
Stockport. Stepping Hill. Sr. H.O. 49
Stoke-on-Trent. Haywood. Jr. H.M.O. 49
Warrington Infy. Pre-reg. H.O. or Sr. H.O. 50
Warwick. H.O. 50
Watford. Peace Mem. Pre-reg. H.O. 50
Weston-super-Mare Gen. H.O. .. 50
Yorkshire. East Riding H.M.C. Locum H.O. or Sr. H.O. 51
B.W.I. Univ. College Hosp. H.O.'s.. 51

(continued overleaf)

Canada. St. John's, Newfoundland. Gen. Residency 51
Michigan U.S.A. Oakwood. Residency 51

NEUROLOGY
National Hosps. for Nervous Diseases. Reg. or Sr. Reg. 38
Aylesbury. Stoke Mandeville. Prereg. H.O. or Sr. H.O. 39
North West Met. R.H.B. P.-t. Cons. . 36

NEUROSURGERY
Bristol-Cossham/Frenchay H.M.C. Sr. H.O. 41

OBSTETRICS AND GYNÆCOLOGY
Annie McCall Maternity, S.W.4. H.O. 37
Central Middlesex, N.W.10. H.O.. . 38
Elizabeth Garrett Anderson, N.W.1. H.O. 38
German, E.8. H.O. 38
Hammersmith, West London & St. Mark's, W.12. Reg. & H.O. .. 38
Memorial, S.E.18. H.O. 38
Mothers' (Salvation Army), E.5. H.O. 38
Blackburn & Dist. H.M.C. Sr. H.O... 40
Canterbury. Kent & Canterbury. H.O. 41
Colchester H.M.C. H.O. 42
Dorchester. Dorset County. H.O. .. 42
Edgware Gen. H.O.'s.. 42
Hillingdon, Middx. H.O.'s 43
Leeds R.H.B. H.O.'s.. 44
Lennoxtown, Stirlinghsire. Lennox Castle Maty. Jr. H.M.O... .. 44
Liverpool. Sefton Gen. H.O.'s .. 45
Manchester R.H.B. Reg. 45
Newcastle United Hosps. Sr. H.O. .. 46
Oxford R.H.B. Reg. 46
Plymouth. South Devon & East Cornwall. H.O. 47
Portsmouth Group H.M.C. Sr. H.O... 47
Reading. Royal Berks. H.O... 47
South West Met. R.H.B. Locum P.-t. Cons. 36
Stockport & Buxton H.M.C. H.O. .. 49
Swansea. Mount Pleasant. Sr. H.O. 49
Warrington Gen. Sr. H.O. 50
Watford. Shrodells. H.O. or Jr. H.M.O. 50
Wolverhampton Group. H.O. 50
Wrexham. Trevalyn Manor Maternity. H.O. 51

OPHTHALMOLOGY
North West Met. R.H.B. P.-t. Sr. H.M.O. 36
Bradford. Royal Eye & Ear. H.O. .. 40
Brighton. Sussex Eye. Sr. H.O. .. 40
Leeds R.H.B. Reg. 44
Manchester R.H.B. Sr. H.M.O. .. 36
Manchester United Hosps. Sr. H.M.O. 36
Newcastle upon Tyne H.M.C. Sr. H.O.'s 46
Nottingham & Midland Eye Infy. Reg. & Sr. H.O.'s 46
Southampton Eye. Sr. H.O. 49
Stoke-on-Trent. North Staffs Royal Infy. Sr. H.O. 49

ORTHOPÆDICS
Hammersmith, West London & St. Marks, W.12. H.O. 38
Birmingham R.H.B. Reg. 40
Bradford. St. Luke's & Woodlands Hosp., Rawdon. Sr. H.O. & H.O. 40
Colchester H.M.C. H.O. 42
Coventry & Warwickshire. Sr. H.O. 41
Croydon Group H.M.C. Reg. 41
Derby. Derbyshire Royal Infy. Sr. H.O. 42
Enfield. Chase Farm. Locum Reg... 42
Isleworth. West Middlesex. Sr. H.O. 43
Leeds R.H.B. H.O.'s.. 44
Leeds. St. James's. Sr. H.O... .. 45
Louth. County Infy. Sr. H.O. 45
Manchester R.H.B. Reg. 45
Norwich. Norfolk & Norwich. H.O. or Sr. H.O. 47
Peterborough Mem. Sr. H.O. 47
Romford. Oldchurch. H.O... 47
Scotland. Western R.H.B. Cons. .. 37
Sheffield R.H.B. Sr. Reg. 48
Sheffield United Hosps. Sr. Reg. .. 48
Southampton. Royal South Hants. H.O. 49
St. Helens & Dist. H.M.C. H.O. .. 49
Stoke-on-Trent. North Staffs Royal Infy. Sr. H.O. 49
Tunbridge Wells. Pembury. Sr. H.O. 49
Yorkshire. East Riding H.M.C. H.O. 51
Canada. St. John's, Newfoundland. Gen. Residency 51

PÆDIATRICS
Central Middlesex, N.W.10. Reg. .. 38
Memorial, S.E.18. H.O. 38
Birmingham. Dudley Road. H.O. .. 40
Leeds R.H.B. H.O. 44
Liverpool United Hosps. Regs. 45
Luton & Dunstable. H.O. 45
Macclesfield. Sr. H.O. 46
Manchester. Duchess of York Hosp. for Babies. Sr. H.O. 46
Norwich. Norfolk & Norwich. H.O... 47
Portsmouth Group H.M.C. Pre-reg. H.O. 47
Shrewsbury. Royal Salop Infy. Sr. H.O. or H.O... 48
St. Helens & Dist. H.M.C. H.O. .. 49
Welsh R.H.B. Locum Cons. 37
Canada. Ottawa Gen. Residency .. 51

PATHOLOGY
Hampstead Gen., N.W.3. Sr. Reg. .. 38
Westminster, S.W.1. Reg. 39
Birmingham United Hosps. Sr. H.O. 40
Chelmsford H.M.C. Locum Reg. .. 41
Manchester R.H.B. Sr. H.M.O. .. 36
Nottingham City. Reg. 46
South West Met. R.H.B. Cons. or Sr. H.M.O. 37
West Dorset Group H.M.C. Reg. .. 50
Canada. Ottawa Gen. Sr. Intern .. 51
South Africa. Provincial Admin. of Cape of Good Hope. Specialist & Med. Pract. (Grade E) 37

PHYSICAL MEDICINE
Manchester R.H.B. Reg. 45

PLASTIC SURGERY
Chepstow, Mon. Sr. H.O. 41

PSYCHIATRY
University College Hosp., W.C.1. Reg. 39
Birmingham R.H.B. Sr. H.M.O. .. 36
Blackburn. Calderstones. Jr. H.M.O. 40
Bristol United Hosps. & South-Western R.H.B. Sr. Reg... .. 40
Coulsdon, Surrey. Cane Hill H.M.C. Reg. 41
Denbigh. North Wales Hosp. for Nervous & Mental Disorders. Jr. H.M.O. or Sr. H.O... 42
Glasgow. North-Eastern Mental Hosps. B.O.M. Jr. H.M.O. .. 43
Glasgow. Stobhill Gen. H.O.'s .. 43
Hornchurch. St. George's. Reg. .. 43
Leeds R.H.B. Locum Regs... 44
Leeds R.H.B. Sr. Regs. & Regs. .. 44
Leicester. Carlton Hayes Mental. Jr. H.M.O. 44
Liverpool. Sefton Gen. H.O.'s .. 45
Macciesfield. Parkside Mental. Jr. H.M.O. 46
Manchester R.H.B. Sr. Reg. 45
Scotland. South-Eastern R.H.B. Sr. Reg. 48
Sheffield R.H.B. Sr. H.M.O. 37
West Malling, Kent. Leybourne Grange Colony for Mental Defectives Jr. H.M.O. 50
Canada. Ottawa Gen. Residencies .. 51

RADIOLOGY
University College Hosp. Reg. .. 39
Birmingham R.H.B. Locum Cons. or Sr. H.M.O. 36
Bristol United Hosps. & South Western R.H.B. P.-t. Regs. 41
Glasgow Royal Infy. Sr. H.O. .. 42
Manchester R.H.B. Sr. H.M.O. .. 36
Manchester United Hosps. Regs. .. 46
Scotland. Eastern R.H.B. Sr. Reg... 48
Wigan & Leigh H.M.C. Locum Cons. 37
South Africa. Provincial Admin. of Cape of Good Hope. Med. Pract. (Grade D) 37

RADIOTHERAPY
Marie Curie, N.W.3. H.O. 38
Leeds United Hosps. Sr. H.O. .. 45
Nottingham Gen. Sr. H.O. or Reg. 46
Canada. Cancer Relief & Research Inst. Asst. Radiotherapist .. 37

SURGERY
Hackney, E.9. Pre-reg. H.O... .. 38
Lambeth, S.E.11. H.O.'s 38
Nelson, S.W.20. H.O. 38
Queen Mary's Hosp. for the East End, E.15. Pre-reg. H.O. 38
St. Mark's, E.C.1. Sr. Reg. or Reg... 39
St. Mary's W.2. P.-t. Sr. H.O. .. 39
Wandsworth Hosp. Group. Sr. H.O... 39
Wanstead, E.11. H.O. 39
Aberystwyth Gen. Sr. H.O... .. 39
Barnstaple. North Devon Infy. Prereg. H.O. 39
Birmingham Accident. H.O... .. 40
Birmingham. Dudley Road. H.O.'s 40
Birmingham R.H.B. Regs. 40
Caernarvon & Anglesey H.M.C. H.O.'s 41
Carlisle. Cumberland Infy. H.O.'s.. 41
Carmarthen. West Wales Gen. Locum Sr. H.O. or H.O. 41
Carshalton. Queen Mary's Hosp. for Child. Reg. 41
Castleford, Normanton & Dist. Sr. H.O. 41
Chelmsford & Essex. Locum Reg. & Pre-reg. H.O. 41
Chelmsford. St. John's. Locum Sr. H.M.O. 36
Chelmsford. St. John's. Sr. H.O. .. 41
Chester-le-Street. Gen. H.O... .. 41
Colchester H.M.C. Sr. H.O. & H.O.'s 42
Derby. Derbyshire Royal Infy. Sr. H.O. 42
Dudley, Stourbridge & Dist. Pre-reg. H.O.'s 42
Durham. Dryburn. H.O. 42
East Anglian R.H.B. Reg. 42
Edgware Gen. H.O. 42
Gt. Yarmouth & Gorleston Gen. H.O. 43
Haverfordwest. Pembroke County War Mem. Sr. H.O. & H.O. .. 43
Hemel Hempstead. West Herts. Prereg. H.O. 43
Hertford County. H.O. 43
Hertford County. Pre-reg. H.O. .. 43
Huddersfield Royal Infy. H.O. .. 43
Hull. Kingston Gen. Sr. H.O. .. 43
Hull. Victoria Hosp. for Sick Child. H.O. 43
Isle of Thanet H.M.C. H.O.'s 44
Isleworth. West Middlesex. H.O. .. 44
Kidderminster & Dist. Gen. H.O. .. 43
Leeds R.H.B. Locum Regs... 44
Leeds R.H.B. Reg. & H.O.'s 44
Leeds United Hosps. Sr. Reg. 44
Leicester Royal Infy. H.O. 44
Lincoln County. Sr. H.O. 45
Liverpool. Sefton Gen. H.O.'s .. 45
Maidstone. West Kent Gen. Pre-reg. H.O. 45
Manchester. Booth Hall Child's. Sr. H.O. 46
Manchester R.H.B. Reg. 45
Newcastle Gen. Sr. H.O. 46
Newcastle R.H.B. Regs. 46
Newmarket Gen. Sr. H.O. & H.O... 46
Norwich. Norfolk & Norwich. H.O.'s 47
Oxford R.H.B. Sr. Reg. 47
Peterborough Mem. H.O. 47
Plymouth. South Devon & East Cornwall. Sr. H.O.'s 47
Portsmouth Group H.M.C. Pre-reg. H.O.'s 47
Redhill. East Surrey. Pre-reg. H.O. & Locum H.O. 47
Romford. Rush Green. H.O. 48
Salford. Hope. Sr. H.O. 48
Salisbury Gen. H.O... 48
Scunthorpe & Dist. War Mem. Reg. 48
Shrewsbury. Royal Salop Infy. H.O. 48
Sidcup & Swanley H.M.C. Locum R.S.O. 48
Southport Gen. Infy. H.O. 48
South West Met. R.H.B. P.-t. Cons. 36
Stafford. Staffordshire Gen. Infy. Pre-reg. H.O. 49
St. Helens & Dist. H.M.C. H.O.'s .. 49
Stockport & Buxton H.M.C. H.O.'s 49
Stoke-on-Trent. Haywood. Jr. H.M.O. 49
Stoke-on-Trent. North Staffs Royal Infy. H.O. 49
Swansea. Sr. H.O. 49
Taplow. Canadian Red Cross Mem. H.O. 49
Taunton H.M.C. Sr. H.O. & H.O. .. 50
Torquay. Torbay. H.O. 49
Warrington Gen. H.O.'s 50
Warwick. H.O. 50
Watford. Peace Mem. Pre-reg. H.O. 50
Welsh R.H.B. Regs. 50
West Dorset Group H.M.C. H.O.'s.. 50
Weston-super-Mare Gen. H.O. 50
Whitehaven, Cumberland. H.O. or Sr. H.O. 50
Wigan. Royal Albert Edward Infy. Pre-reg. H.O. 50
Wolverhampton Group. H.O.'s .. 50
Worcester. Ronkswood. Sr. H.O. & Pre-reg. H.O. 50/51
Canada. St. John's, Newfoundland. Gen. Residency 51

THORACIC SURGERY
South East Regional Thoracic Surgery Unit, S.E.18. Sr. H.O. 39
St. George's, S.W.1. Sr. H.O. .. 39
Blackpool. Victoria. Reg. or Sr. H.O. 40
Leeds R.H.B. H.O. 44
Leeds United Hosps./R.H.B. Regs... 45
Manchester. West Manchester H.M.C. Sr. H.O. 46

TROPICAL MEDICINE
Liverpool. Sefton Gen. H.O... 45

PUBLIC APPOINTMENTS 51

GENERAL PRACTICE 52

MISCELLANEOUS 52

The Terms and Conditions of Service of Hospital Medical and Dental Staff apply to all N.H.S. hospital posts we advertise, unless otherwise stated. Canvassing disqualifies, but candidates may normally visit the hospital by appointment.

Academic and Educational

ROYAL COLLEGE OF PHYSICIANS OF LONDON

The LORD AMULREE, M.D., F.R.C.P., will deliver the F. E. WILLIAMS LECTURE on TUESDAY, 12TH JULY, 1955, at 5 P.M. at the College, Pall Mall East, S.W.1.

Subject: "Modern Hospital Treatment and the Pensioner."

Any member of the Medical Profession admitted on presentation of card.

By order of the President.

HAROLD BOLDERO, Registrar.

UNIVERSITY OF DURHAM
KING'S COLLEGE, NEWCASTLE UPON TYNE

COURSES OF INSTRUCTION FOR THE POSTGRADUATE DIPLOMA IN PSYCHOLOGICAL MEDICINE

PART I. A part-time course will be given on 1½ days a week throughout the year, commencing in OCTOBER. Fee £20.

PART II. A full-time 6 months course in Psychiatry and Neurology commences in OCTOBER. Fee £40.

The above courses are integrated with the Newcastle and Sheffield Regional Hospital Boards' Training Schemes for psychiatrists. Arrangements can be made for candidates from overseas to complete the requisite clinical experience during the 6 months course.

Separate courses including clinical experience are available in Neurology (2 terms, fee £15) and Child Psychiatry (2 months, fee £25).

Further particulars, regulations and syllabus for the Diploma and application forms may be obtained from the Assistant Registrar, Medical School, King's College, Newcastle upon Tyne, 1. G. R. HANSON, Registrar of King's College.

UNIVERSITY OF GLASGOW

RESEARCH ASSISTANTSHIP IN VIRUS DISEASES

A Science graduate assistant is required for research involving tissue culture of viruses. Previous experience is not essential. The salary, which will be paid from a grant available for 3 years, will be within the range £410–£25–£765.

Applications (6 copies), with full details of qualifications and experience, and the names of 2 referees, should be sent, not later than 25th July, 1955, to the Secretary of the University Court, The University, Glasgow, W.2, from whom further particulars may be obtained.

ROBT. T. HUTCHESON, Secretary of University Court.

THE UNIVERSITY OF SHEFFIELD

A REFRESHER COURSE for general practitioners will be held during the week beginning MONDAY, 19TH SEPTEMBER, and will be repeated during the following week. The fee for 1 week's attendance is 5 guinea, and accommodation at 1 of the University's Halls of residence can be arranged at a moderate additional charge. National Health Service Practitioners are (subject to certain conditions) eligible to have the course fee paid on their behalf and to receive also certain allowances (travelling expenses, subsistence, locum fees).

As the number who can be accepted is limited, inquiries and applications (stating whether or not the latter are made under the Scheme for National Health Service Practitioners, which week it is desired to attend, and whether residential accommodation is desired) should be addressed as soon as possible to the Dean of the Faculty of Medicine, 358, Mushroom-lane, Sheffield, 10.

MEDICAL POSTGRADUATE DEPARTMENT OF THE UNIVERSITY OF BRISTOL

A COURSE IN DIAGNOSTIC RADIOLOGY in preparation for the D.M.R.D. of the Conjoint Board (R.C.S. and R.C.P.) will begin in OCTOBER, 1955. The course, which will be half-time, will last for 2 academic years (i.e., until June, 1957). Instruction is given at the United Bristol Hospitals, and at other hospitals in the Bristol Clinical Area. The fee for the whole 2-year course is £52 10s. A limited number of half-time Registrarships are available for successful candidates for the course. (See separate advertisement.)

Further information and application forms for the course may be obtained from The Director of Radiology, Royal Infirmary, Bristol, 2. Applications must be submitted by 9th July, 1955.

THE MILROY LECTURES ON STATE MEDICINE AND PUBLIC HEALTH

The Council of the Royal College of Physicians of London are prepared to receive applications for the office of MILROY LECTURER for 1957.

Applications must be addressed to the Registrar, Royal College of Physicians, Pall Mall East, S.W.1, to reach the College on or before WEDNESDAY, 7TH SEPTEMBER, 1955, and to include a short synopsis of the subject selected by the candidate.

2 LECTURES are to be given on a TUESDAY and THURSDAY in FEBRUARY or MARCH, 1957.

A copy of Dr. Milroy's "Suggestions" on the subject of his bequest, and information as to the emolument, may be obtained from the Registrar.

MENTAL HEALTH RESEARCH FUND

Applications are invited for 2 LEVERHULME RESEARCH FELLOWSHIPS from suitably qualified and experienced persons wishing to pursue full-time research work bearing on problems of mental health, whether in clinical psychiatry or in one of its supporting sciences. The appointments are for 2–3 years in the first instance, renewable for a maximum of 1 year thereafter. The value of each Fellowship, which has been provided by the Leverhulme Trust, is £2000 p.a. (including superannuation).

Further information from the Hon. Secretary, Mental Health Research Fund, 39, Queen Anne-street, London, W.1.

WESTERN INFIRMARY OF GLASGOW

COURSE OF INSTRUCTION FOR D.M.R.(T.)

Complete course of instruction for the Diploma in Medical Radiotherapy, granted by the Royal College of Physicians of London and the Royal College of Surgeons of England, will commence at the Western Infirmary, Glasgow, in OCTOBER, 1955.

Application for admission should be made to the Medical Superintendent.

LADY CADE MEMORIAL FELLOWSHIP

Applications are invited from medically qualified South Africans with a wide experience in the morphological field of cancer. A chemical and research background will be a recommendation. Preference will be given to those holding Senior posts at Universities and Institutions, and the successful Fellow will be expected to return to South Africa at the termination of the Fellowship. The value of the Fellowship will be not less than £2500 gross p.a. The successful applicant will be required to take up the Fellowship by not later than October, 1956.

Forms of application and the rules governing this Fellowship can be obtained from the Secretary, National Cancer Association of South Africa, P.O. Box 2000, Johannesburg. The closing date for applications is 30th August, 1955.

BRITISH MEMORIAL FELLOWSHIPS

POLIOMYELITIS RESEARCH

Applications are invited for a FELLOWSHIP IN RESEARCH into the treatment and aftercare of Poliomyelitis under the auspices of the Consultative Council on Poliomyelitis, Victorian Department of Health, Melbourne, Australia.

The Fellowship carries a grant of £1000 (Australian) which is intended to cover the cost of transit by sea to and from Melbourne, and all expenses for a period of approximately 10 months study and research in the State of Victoria.

The Fellowship is available to a medical practitioner whose duties associate him with public health work in the treatment and aftercare of cases of poliomyelitis in the country districts of England, Scotland and Wales.

Applicants should not be over the age of 35 years.

All particulars are available from the Hon. Sir JOHN LIENHOP, Agent-General for Victoria, and Chairman of the British Memorial Fund Committee, Victoria House, Strand, London. The closing date for the receipt of applications is 5th August, 1955.

INSTITUTE OF LARYNGOLOGY AND OTOLOGY

(UNIVERSITY OF LONDON), 330/332, Gray's Inn-road, W.C.1. LECTURER IN PATHOLOGY. Applications are invited for a post of Lecturer in the Department of Pathology and Bacteriology. The duties will include assistance in the general work of the Department (including the teaching of postgraduate students) and in various research projects. The successful candidate will be encouraged and given the necessary facilities to continue or to commence original work connected with this specialty, and opportunity to prepare for higher qualifications. The Lecturer will be given honorary rank as a Senior Registrar by the associated Royal National Throat, Nose, and Ear Hospital. Salary according to the revised University scales—£1000–£100–£1300, plus family allowances where applicable with superannuation provision.

Applications, with the names of 2 referees, should be sent to the Secretary, from whom further information can be obtained, not later than 5th August, 1955.

UNIVERSITY OF ST. ANDREWS, Queen's College, DUNDEE. EASTERN REGIONAL HOSPITAL BOARD, SCOTLAND. LECTURESHIP IN SURGERY. Applications are invited for the post of Lecturer (grade III) in the Department of Surgery, Queen's College, Dundee. Salary range £700–£100 p.a.–£1200. Placing on scale according to qualifications and experience. Duration of appointment 2 years. Superannuation and family allowance benefits; a grant towards removal expenses may be made. An honorary Hospital appointment of Registrar status in the Professorial Unit in the Dundee Royal Infirmary will be associated with the post.

Further particulars from the undernoted, with whom applications (6 copies), giving the names of 3 referees, should be lodged not later than 15th July, 1955.

PATRICK CUMMING, Joint Clerk to the University Court.
Queen's College, Dundee.

UNIVERSITY OF ST. ANDREWS. Eastern Regional HOSPITAL BOARD. The University Court of the University of St. Andrews and the Eastern Regional Hospital Board invite applications for appointment as LECTURER IN THERAPEUTICS in Queen's College, Dundee, University of St. Andrews. The salary attached to this appointment is £1700 rising by annual increments to £2200 p.a. together with F.S.S.U. benefits and the person appointed will receive an Honorary appointment from the Eastern Regional Hospital Board as Assistant Physician with the status of Consultant. The University of St. Andrews operates a scheme of family allowances and a grant towards expenses of removal may be made.

Further particulars of the appointment may be obtained from the undersigned, with whom 14 copies of the application containing the names of 3 referees should be lodged not later than 15th August, 1955.

PATRICK CUMMING, Joint Clerk to the University Court.

UNIVERSITY OF EDINBURGH. Department of Therapeutics. Applications are invited for a LECTURESHIP IN THERAPEUTICS. Salary scale £1200–£100–£1600 p.a., with superannuation benefit and family allowance where applicable. The successful candidate will be expected to take up duty on 1st October, 1955, or as soon thereafter as possible.

Further particulars may be obtained from the undersigned, with whom applications (6 copies), together with the names of 2 referees, should be lodged not later than 30th July, 1955.

CHARLES H. STEWART, Secretary to the University.

UNIVERSITY COLLEGE LONDON (Gower-street, W.C.1) requires Full-time ASSISTANT LECTURER IN ANATOMY (Prof. J. Z. YOUNG) to undertake teaching and research. Duties to commence 1st October, 1955. Salary within the range £700–£900 p.a., according to qualifications and experience. Family allowances.

Applications, to be received by 31st August, should be sent to the Secretary, from whom further particulars may be obtained.

THE UNIVERSITY OF LIVERPOOL. Applications are invited for the post of Temporary LECTURER in the Department of Child Health for a period of 1 year from 1st September, 1955, at a salary within the range £1000–£1700, according to qualifications and experience. Clinical responsibilities and research facilities under the general direction of the Professor of Child Health will be available within the Department of Child Health; The Temporary Lecturer will be offered an honorary contract by the Liverpool Regional Hospital Board in respect of clinical work undertaken on behalf of the Board.

Applications, stating age, academic qualifications and experience, together with the names of 3 referees, should be received not later than 23rd July, 1955, by the undersigned, from whom further particulars of the conditions of appointment may be obtained. STANLEY DUMBELL, Registrar.

UNIVERSITY OF SYDNEY, Australia. Applications are invited for the position of SENIOR LECTURER IN PATHOLOGY. The salary for a Senior Lecturer is within the range of £A1800–£A2150 p.a., with annual increments of £A70. The salary is subject to deductions under the State Superannuation Act. The commencing salary will be fixed according to the qualifications and experience of the successful applicant. Finance available for home purchase under Staff Members' Housing Scheme.

Further particulars and information as to the method of application may be obtained from the Secretary, Association of Universities of the British Commonwealth, 36, Gordon-square, London, W.C.1. The closing date for the receipt of applications, in Australia and London, is 31st July, 1955.

UNIVERSITY OF SYDNEY, Australia. Applications are invited for the position of LECTURER/SENIOR LECTURER IN BIOCHEMISTRY. The salary for a Lecturer is within the range of £A1200–£A80–£A1750 p.a., for a Senior Lecturer £A1800–£A70–£A2150. The salary is subject to deductions under the State Superannuation Act. The commencing salary will be fixed according to the qualifications and experience of the successful applicant. Finance available for home purchase under Staff Members' Housing Scheme.

Further particulars and information as to the method of application may be obtained from the Secretary, Association of Universities of the British Commonwealth, 36, Gordon-square, London, W.C.1. The closing date for the receipt of applications, in Australia and London, is 31st July, 1955.

ST. VINCENT'S HOSPITAL CLINICAL SCHOOL. UNIVERSITY OF MELBOURNE. Applications are called for the position of the JOHN HOLT DIRECTOR OF BIOCHEMICAL RESEARCH in the St. Vincent's Hospital School of Medical Research. The successful applicant will be in full charge of the Biochemical Research work but would merely have supervisory control over the hospital's routine Biochemical Department. The research laboratories have been newly built and occupy approximately 4500 square feet. Adequate funds are available for equipment. Initially the department staff will comprise the Director, 2 Assistant Biochemists and 2 Technicians. The assistant staff will be appointed on the advice of the Director. Study leave will be granted after a period of 5 years service. A limited amount of money for the attendance at important scientific meetings will be available. Salary is £3000 a year Australian currency; superannuation according to F.S.S.U. Reasonable travelling expenses to Melbourne will be paid for successful applicant and family. Assistance will be given in finding suitable accommodation. Further details and plans of the laboratories may be seen at the office of the Secretary of the Association of the Universities of the British Commonwealth, Gordon-square, London, W.C.1, or at St. Vincent's Hospital.

Closing date for applications 20th August. Arrangements will be made to interview selected overseas applicants in London between 23rd and 30th August.

E. W. R. GRACE, Chief Executive Officer and Secretary.

Hospital Services: Senior Appointments

NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD.

(1) SENIOR CASUALTY OFFICER (whole-time), Bedford General Hospital (437 Beds) to organise the work of the Casualty Department and to assist in the Orthopædic and Fracture Department, subject to the general supervision of the Senior Surgeons. Higher qualification in surgery desirable. Tenure of post not exceeding 4 years. Salary within the scale £1500 (unless below age 32)–£50–£1950.

Applications by 8th August, 1955.

(2) CONSULTANT NEUROLOGIST (1 half-day a week), Lister Hospital, Hitchin (350 Beds), and Bedford General Hospital (437 Beds); fortnightly visit to each. Hospitals may be visited by direct appointment.

Applications by 4th August, 1955.

(3) OPHTHALMOLOGIST (Senior Hospital Medical Officer grade), Paddington School Treatment Centre, 12, Maida-avenue, W.2. 2 half-days a week (Monday and Friday mornings). Candidates may apply for either or both sessions. Clinic may be visited by arrangement with the Divisional Medical Officer, 313, Harrow-road, W.9.

Applications by 2nd August, 1955.

Application forms obtainable from, and returnable to, Secretary, North West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1.

BIRMINGHAM REGIONAL HOSPITAL BOARD. Locum Tenens RADIOLOGIST required. Consultant or Senior Hospital Medical Officer, for 2–3 months.

Apply Secretary, 10, Augustus-road, Birmingham, 15.

QUEEN CHARLOTTE'S AND CHELSEA HOSPITALS. Applications are invited from suitably qualified registered medical practitioners for the appointment of ANÆSTHETIST (Consultant status) at Chelsea Hospital for Women, Dovehouse-street, London, S.W.3, on the basis of 2 notional half-day sessions weekly.

Applications, with the names of 3 referees, should reach the Secretary to the Board of Governors, 339, Goldhawk-road, W.6, by 31st July.

BIRMINGHAM REGIONAL HOSPITAL BOARD.

(1) **Stoke-on-Trent Group**

Whole-time CONSULTANT ANÆSTHETIST. Duties at City General Hospital (845 Beds), North Staffs Royal Infirmary, Stoke-on-Trent (445 Beds), and Cheshire Joint Sanatorium (219 Beds, including thoracic surgery). Wide experience specialty, including thoracic surgical procedure required. D.A. or F.F.A.R.C.S. essential.

(2) **North Staffs (Mental B) Group**

Whole-time ASSISTANT PSYCHIATRIST. Stallington Hall, Blythe Bridge (mental deficiency patients). Experience specialty and D.P.M. required. Salary £1500–£1950 p.a. No accommodation available.

Applications (15 copies), stating name, age, nationality, qualifications, and present and previous appointments and details of 3 referees, to Secretary, 10, Augustus-road, Birmingham, 15, before 18th July, 1955.

CHELMSFORD. ST. JOHN'S HOSPITAL. Locum Tenens SENIOR HOSPITAL MEDICAL OFFICER in Surgery required to work at above Hospital for period 27th August–10th September.

Applications to the Secretary, Chelmsford Hospital Management Committee, London-road, Chelmsford.

LEEDS REGIONAL HOSPITAL BOARD. Whole-time Locum SENIOR HOSPITAL MEDICAL OFFICER in Geriatrics required immediately for hospital and domiciliary visiting within the Bradford Geriatric Service.

Applications, stating age, qualifications and details of experience, together with names of 3 referees, to the Secretary, Parkparade, Harrogate, by 9th July, 1955.

MANCHESTER REGIONAL HOSPITAL BOARD.

(a) Whole-time NON-RESIDENT ASSISTANT RADIOLOGIST (Senior Hospital Medical Officer) to the Stockport and Buxton Hospitals (Stockport Infirmary, Stepping Hill Hospital, Stockport, Devonshire Royal Hospital, Buxton, and Buxton Hospital, &c.). Wide experience and D.M.R.D. essential appointee to live in Stockport area, 15th July, 1955.

(b) Whole-time TUBERCULOSIS PHYSICIAN (Senior Hospital Medical Officer), Rochdale and District Hospitals (Wolstenholme Pulmonary Hospital, Springfield Sanatorium, Sparthfield Clinic, &c.) to work under general guidance of a Consultant. Previous experience of thoracic medicine and tuberculosis essential, higher qualification desirable. The appointment may be made in conjunction with the Local Health Authorities concerned for whom the appointee would carry out duties in connection with prevention, care and aftercare. 18th July, 1955.

(c) Whole-time NON-RESIDENT ASSISTANT PATHOLOGIST (Senior Hospital Medical Officer) to the West Manchester Hospital Centre based on the Group Laboratory at Park Hospital, Davyhulme, near Manchester. Experience in all branches of hospital pathology desirable. Successful candidate will work under general guidance of a Consultant. 12th July, 1955.

Application forms from the Senior Administrative Medical Officer to the Board, Cheetwood-road, Manchester, 8, to be returned by dates stated.

MANCHESTER REGIONAL HOSPITAL BOARD. Whole-time NON-RESIDENT ASSISTANT OPHTHALMOLOGIST (Senior Hospital Medical Officer) to the Ophthalmic Department, Victoria Hospital, Burnley, and associated School Eye Clinics in Burnley C.B. and Lancashire C.C. areas. About 4 sessions hospital and 7 sessions clinic work each week.

Application forms from the Senior Administrative Medical Officer to the Board, Cheetwood-road, Manchester, 8, to be returned by 25th July, 1955.

MANCHESTER. UNITED MANCHESTER HOSPITALS. MANCHESTER ROYAL EYE HOSPITAL. Applications are invited for the post of Full-time SENIOR HOSPITAL MEDICAL OFFICER (non-resident). Previous experience in ophthalmology essential. The terms and conditions of service for hospital medical and dental staffs will apply.

Applications, giving details of past experience and qualifications, together with the names of 3 referees, to be addressed to the undersigned as early as possible. (Special application forms can be obtained on request.)

F. J. CABLE, Secretary, United Manchester Hospitals.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD requires Part-time CONSULTANT SURGEON (4 half-days per week) for the West Dorset Group of hospitals to include as required visits to Harrison Mental Hospital, Dorchester. The successful applicant will be required to reside in the Dorchester or Weymouth area. Applicants may visit the hospitals by arrangement with Mr. D. A. PINKHAM, F.C.I.S., F.H.A., Group Secretary, West Dorset Group Hospital Management Committee, Damers-road, Dorchester.

Applications (5 copies), stating age, qualifications, experience and names and addresses of 3 referees, to the Area Secretary, Highcroft, Romsey-road, Winchester, by 18th July.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD requires Locum Tenens CONSULTANT in Obstetrics and Gynæcology (9 sessions weekly) for the West Dorset Group of hospitals, from 26th July to 3rd September, 1955, inclusive. Remuneration in accordance with the terms and conditions of service of hospital medical staff.

Applications, with names of 3 referees, to Area Secretary, South West Metropolitan Regional Hospital Board, Highcroft, Romsey-road, Winchester, by 16th July, 1955.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD requires CLINICAL PATHOLOGIST of Consultant or Senior Hospital Medical Officer status for the Southampton Group of hospitals immediately, for a period of 3 months. Salary in accordance with the terms and conditions of service of hospital medical staff.

Applications, with the names of 3 referees, to Area Secretary, South West Metropolitan Regional Hospital Board, Highcroft, Romsey-road, Winchester.

SCOTLAND. NORTHERN REGIONAL HOSPITAL BOARD. Applications are invited for the whole-time post of ASSISTANT ANÆSTHETIST based on the Inverness Hospitals. Salary scale is £1500 (unless below age 32)–£50–£1950 p.a. Candidates should have a higher qualification in anæsthetics.

Schedules of application may be obtained from the undersigned, with whom applications should be lodged by 23rd July, 1955.

A. M. FRASER, M.D.,
Secretary and Administrative Medical Officer.
Office of the Northern Regional Hospital Board,
Raigmore, Inverness.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the following appointments :—

CONSULTANT PHYSICIAN based at the Western Infirmary, Glasgow. The appointment will be part-time remunerated on the basis of 8 notional half-days per week.

CONSULTANT ORTHOPÆDIC SURGEON based on Law Hospital, Carluke. The appointment will be whole-time or part-time remunerated on the basis of 9 notional half-days per week.

These appointments are subject to the National Health Service (Scotland) superannuation regulations.

Applications (16 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, not later than 30 days after the publication of this advertisement.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time SENIOR ASSISTANT PSYCHIATRIST required for Bracebridge Heath Hospital, Lincoln. Salary scale £1500–£50–£1950. Self-contained flat available.

Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 29th July, 1955.

SOUTH AFRICA. PROVINCIAL ADMINISTRATION OF THE CAPE OF GOOD HOPE. HOSPITALS DEPARTMENT. Vacancy : Chief Pathologist.

1. Applications are invited from registered medical practitioners (registered specialists) for appointment to the post of CHIEF PATHOLOGIST, with salary at the rate of £2280 p.a. (fixed) initially on the establishment of the Head Office of the Hospitals Department of the Cape Provincial Administration, Cape Town.

2. In addition to the salary indicated, a cost-of-living allowance at rates prescribed from time to time by the Administrator is payable to whole-time officials and employees.

3. The conditions of service are prescribed in terms of Hospital Board Service Ordinance No. 19 of 1941, as amended, and the regulations framed thereunder.

4. The successful candidate will be responsible administratively to the Director of Hospital Services, and will have to maintain the duties of organisation and overall control of a pathological service to serve the Cape Province.

5. Candidates must be registered pathologists and previous laboratory experience is essential.

6. The successful applicant will be required to submit satisfactory birth and health certificates and his/her appointment will be subject to the following conditions :—

(*a*) Appointment will be on contract for 5 years in the case of a citizen of a Commonwealth Country or the Republic of Ireland and 6 years in the case of a citizen of European countries other than the United Kingdom and the Republic of Ireland.

(*b*) Transport expenses (third class by rail overseas and second or cabin class steamship fare and first class by rail in the Union) necessarily incurred by the successful applicant from place of residence to the place of assumption of duty in South Africa, will be defrayed by the Administration provided that, if the contract is broken within 1 year of the date of assumption of duty the person appointed must refund to the Administration the full amount paid in respect of transport expenses and if the contract is broken within 5 years of the date of assumption of duty in the case of a Commonwealth citizen and 6 years in the case of a citizen of another European country, the person appointed shall refund to the Administration the pro rata share of the full amount above referred to in respect of the unexpired period.

(*c*) The person so appointed will be offered permanent appointment during the term of contract but not earlier than 3 years from the date of assumption of duty or with effect from the conclusion of the contract, provided he/she has passed an examination in Afrikaans as second language, which examination shall not be lower than the standard required for the Junior Certificate Examination of the Department of Education of this Province and provided further that his/her services and conduct during the period of contract are satisfactory and his/her state of health is such as will enable him/her to continue to discharge efficiently all the duties of the post in which he/she will be employed.

7. Application must be made in duplicate on the prescribed form, Staff 23, which is obtainable from the Staff Clerk, Room 102, South Africa House, Trafalgar-square, London, W.C.2.

8. The completed application forms must be addressed to the Director of Hospital Services, P.O. Box 2060, Cape Town, South Africa, and must reach him not later than 15th July, 1955.

9. Candidates must state the earliest date on which they can assume duty.

SOUTH AFRICA. PROVINCIAL ADMINISTRATION OF THE CAPE OF GOOD HOPE. HOSPITALS DEPARTMENT. Vacancies.

1. Applications are invited from registered medical practitioners for appointment to the following posts :—

MEDICAL PRACTITIONER (Grade E), Pathologist, with salary at the rate of £1800 p.a. (fixed) at Kimberley Hospital, Kimberley, Cape Province.

MEDICAL PRACTITIONER (Group D), Radiologist, with salary at the rate of £1680 p.a. (fixed) at the Sir Henry Elliot Hospital, Umtata, Cape Province.

2. In addition to the salary indicated above, a cost-of-living allowance at rates prescribed from time to time by the Administration is payable, at present amounting to £234 p.a. for a married man.

3. The conditions of service are prescribed in terms of Hospital Board Service Ordinance No. 19 of 1941, as amended, and regulations framed thereunder.

4. The successful candidates will be required to submit satisfactory birth and health certificates and their appointment will be subject to the following conditions :—

(*a*) Appointment will be on contract for 5 years in the case of a citizen of a Commonwealth country or the Republic of Ireland and 6 years in the case of a citizen of European countries other than the United Kingdom and the Republic of Ireland.

(*b*) Transport expenses (third class by rail overseas and second or cabin class steamship fare and first class by rail in the Union) necessarily incurred by the successful applicant from place of residence to the place of assumption of duty in South Africa, will be defrayed by the Administration provided that, if the contract is broken within 1 year of the date of assumption of duty the person appointed must refund to the Administration the full amount paid in respect of transport expenses and if the contract is broken within 5 years of the date of assumption of duty in the case of a Commonwealth citizen and 6 years in the case of a citizen of another European country, the person appointed shall refund to the Administration the pro rata share of the full amount above referred to in respect of the unexpired period.

(*c*) The person so appointed will be offered permanent appointment during the terms of contract but not earlier than 3 years from the date of assumption of duty or with effect from the conclusion of the contract, provided he/she has passed an examination in Afrikaans as second language, which examination shall not be lower than the standard required for the Junior Certificate Examination of the Department of Education and this Province and provided further that his/her services and conduct during the period of contract are satisfactory and his/her state of health is such as will enable him/her to continue to discharge efficiently all the duties of the post in which he/she will be employed.

5. Application must be made in duplicate on the prescribed form, Staff 23, which is obtainable from the Staff Clerk, Room 102, South Africa House, Trafalgar-square, London, W.C.2.

6. The completed application forms must be addressed to the Director of Hospital Services, P.O. Box 2060, Cape Town, South Africa, and must reach him not later than 29th July, 1955.

7. Candidates must state the earliest date on which they can assume duty.

CANADA. THE CANCER RELIEF AND RESEARCH INSTITUTE, WINNIPEG, MANITOBA, requires ASSISTANT RADIOTHERAPIST for recently established Radiation Therapy Centre housing modern X-ray machines, including a Cobalt^{60} Unit. Remuneration commencing at $8700 for candidate with diploma.

Applications, stating age, qualifications, and experience, should be submitted to the Medical Director prior to 15th August.

QUEENSLAND. RED CROSS BLOOD TRANSFUSION SERVICE. Applications are invited for the position of ASSISTANT MEDICAL DIRECTOR (full-time). Duties will include supervision of blood donors, serum preparation, laboratory tests, and control of supply of blood and blood products. Facilities are available for a wide range of investigational work. There is a well-equipped Biochemistry Laboratory. Salary range £2000 with annual increments of £100 to a maximum of £2500. Commencing salary dependent upon qualifications and experience in laboratory and clinical work. Superannuation on the basis of 50/50 contribution is expected to be available. Salary to commence from date of embarkation. Reasonable travelling expenses will be reimbursed subject to usual conditions. Annual leave 4 weeks p.a. Termination of appointment subject to 3 months notice on either side.

Applications will be received by Secretary, 409, Adelaide-street, Brisbane, until 1st August, 1955.

WELSH REGIONAL HOSPITAL BOARD. Whole-time Locum Tenens CONSULTANT PÆDIATRICIAN required Caernarvon and Anglesey area 1st–13th August, 1955.

Applications, naming 2 referees, to Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff.

WIGAN AND LEIGH HOSPITAL MANAGEMENT COMMITTEE. Locum SECOND CONSULTANT RADIOLOGIST required for the whole of July, 1955. Accommodation available.

Applications, with full details and names of 2 referees, should be forwarded to the Secretary, Royal Albert Edward Infirmary, Wigan, as soon as possible.

Hospital Services : Junior Appointments

ANNIE McCALL MATERNITY HOSPITAL, Jeffrey's-road, S.W.4. Applications are invited from registered Women medical practitioners for the post of RESIDENT OBSTETRIC HOUSE SURGEON (post recognised for D.Obst.R.C.O.G.). Appointment is for a period of 6 months. Vacant on 1st August.

Applications, stating age, qualifications with dates, and nationality, accompanied by copies of 3 recent testimonials, should be sent to the Secretary, Lambeth Group Hospital Management Committee, Renfrew-road, S.E.11, within 7 days of the appearance of this advertisement.

BETHNAL GREEN HOSPITAL, Cambridge Heath-road, London, E.2. (Acute General—309 Beds.) HOUSE PHYSICIAN. Post recognised for pre-registration purposes.

Applications, stating age, experience, qualifications and copies of 2 testimonials, to the Hospital Secretary by 9th July, 1955.

CENTRAL MIDDLESEX HOSPITAL, Park Royal, N.W.10. Locum SENIOR REGISTRAR required in Department of Anæsthetics from 1st August, 1955, until appointment is made. Candidates must be F.F.A.R.C.S. Whole-time, non-resident except when on duty. Duties may include undergraduate teaching.

Applications to Medical Director immediately.

CENTRAL MIDDLESEX HOSPITAL, Park Royal, N.W.10. RESIDENT HOUSE OFFICER in Obstetric and Gynæcological Department. Post recognised for M.R.C.O.G. Appointment from 1st August, 1955.

Applications, with copies of 2 testimonials, to Medical Director by 9th July, 1955.

CENTRAL MIDDLESEX HOSPITAL, Park Royal, N.W.10. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR in Pædiatric Department. Whole-time, non-resident except when on duty. Under supervision of Consultant Pædiatrician. Neonatal experience desirable. To commence 1st August, 1955. Hospital may be visited by appointment.

Application forms obtainable from, and returnable to, Group Secretary, Central Middlesex Group Hospital Management Committee, Acton-lane, N.W.10, by 13th July, 1955.

COLINDALE HOSPITAL, Colindale-avenue, London, N.W.9. (300 Beds.) NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. MEDICAL REGISTRAR (whole-time), resident or non-resident, required at above Hospital for pulmonary and orthopædic tuberculous patients and with a Non-tuberculous Observation Unit. Hospital may be visited by direct appointment with Physician-Superintendent.

Application forms obtainable from, and returnable to, Group Secretary, Hendon Group Hospital Management Committee, Edgware General Hospital, Edgware, Middlesex, by 16th July, 1955.

ELIZABETH GARRETT ANDERSON HOSPITAL, Euston-road, N.W.1. (ROYAL FREE HOSPITAL GROUP.) Applications are invited from pre-registration and registered Women medical practitioners for the post of OBSTETRIC HOUSE SURGEON (recognised for the M.R.C.O.G.). Duties to commence 1st September, 1955. Appointment for 6 months. Salary in accordance with Ministry of Health scale for House Officers.

Applications, with copies of 3 recent testimonials, to be sent to the Secretary, Elizabeth Garrett Anderson Hospital, by 11th July, 1955.

GERMAN HOSPITAL, London, E.8. (General—157 Beds.) Applications are invited from registered medical practitioners for the 6 months appointment of HOUSE SURGEON (obstetric and gynæcology) vacant 8th August, and should be sent to the Group Secretary, Hackney Hospital, E.9, quoting GH/HSO.

HACKNEY HOSPITAL, London, E.9. (General—844 Beds.) Applications for the 6 months appointment of Pre-registration HOUSE SURGEON (post vacant 1st August; recognised for F.R.C.S.), should reach Secretary, above address, by 9th July, quoting HH/PHS.

HACKNEY HOSPITAL, London, E.9. (General—844 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER ANÆSTHETIST. The post (now vacant) is recognised for the F.F.A.R.C.S. examination and offers wide experience of anæsthesia and opportunities for studying for higher qualifications.

Apply immediately to Group Secretary, above address, quoting HH/SHOA.

HAMMERSMITH, WEST LONDON AND ST. MARK'S HOSPITALS BOARD OF GOVERNORS, Ducane-road, London, W.12. Applications invited for following posts :—

Hammersmith Hospital and Postgraduate Medical School

Whole-time NON-RESIDENT CASUALTY OFFICER (Senior House Officer grading) for 6 months commencing 1st September.

HOUSE SURGEON (orthopædic) required 16th August.

Hammersmith Hospital and Institute of Obstetrics and Gynæcology

Whole-time NON-RESIDENT REGISTRAR (obstetrics and gynæcology) 1st September.

HOUSE OFFICER (gynæcology) 1st September. Post recognised for M.R.C.O.G.

Applications, stating age, qualifications, experience, copies of 2 recent testimonials (names of 2 referees for Registrar post), to Secretary, Board of Governors, by 13th July.

HAMPSTEAD GENERAL HOSPITAL. (The Royal Free HOSPITAL GROUP.) Applications from registered medical practitioners (Men or Women) are invited for the post of Whole-time NON-RESIDENT SENIOR REGISTRAR in Clinical Pathology at the Hampstead General Hospital. Appointment for 1 year in the first instance, from 1st September, 1955. Experience in clinical pathology is essential, and in addition special training in biochemistry would be an advantage.

Formal application, stating age, qualification and experience, together with the names of 3 referees, should be sent to the Secretary, the Hampstead General Hospital, Haverstock Hill, N.W.3, not later than 22nd July, 1955.

LAMBETH HOSPITAL, Kennington, S.E.11. Applica-tions are invited from pre-registration and registered medical practitioners for the post of RESIDENT HOUSE PHYSICIAN, falling vacant on 1st August, 1955. Salary in accordance with the National Health Act.

Forms of application to be obtained from the Physician-Superintendent at the Hospital. Stamped addressed envelope should be enclosed.

LAMBETH HOSPITAL, Brook-drive, S.E.11. Applica-tions are invited for the post of MEDICAL REGISTRAR, vacant in August. The appointment will be for 1 year in the first instance. A higher qualification in medicine is desirable. Canvassing will disqualify, but candidates are invited to visit the Hospital.

Forms of application (enclosing stamped addressed envelope) from the Group Secretary, Lambeth Group Hospital Management Committee, Renfrew-road, S.E.11, to whom completed forms should be returned not later than 15th July, 1955.

LAMBETH HOSPITAL, Brook-drive, S.E.11. Applica-tions are invited from pre-registration and registered medical practitioners for posts of HOUSE SURGEON (2) falling vacant on 8th and 11th August, 1955. Appointments are for 6 months, recognised for the F.R.C.S.

Application forms from the Physician-Superintendent.

MARIE CURIE HOSPITAL, 66, Fitzjohn's-avenue, Hampstead, N.W.3. Applications are invited from registered medical practitioners for the post of GYNÆCOLOGICAL HOUSE SURGEON (radiotherapy), vacant immediately.

Applications, with copies of testimonials, to the Administrative Officer.

MEMORIAL HOSPITAL, Shooters Hill, Woolwich, S.E.18. Applications are invited for the appointment of PÆDIATRIC HOUSE PHYSICIAN. The post entails routine ward and out-patient work as well as experience with neonates, and includes general and casualty duties. Recognition for D.C.H. pending. This post is not recognised for pre-registration purposes.

Apply to Group Secretary, Memorial Hospital, Woolwich, S.E.18, enclosing copies of 2 recent testimonials.

MEMORIAL HOSPITAL, Shooters Hill, Woolwich, S.E.18. HOUSE SURGEON (gynæcology and obstetrics), vacant now. Recognised for M.R.C.O.G. for Gynæcology. Small Obstetric Unit, 20 Beds.

Apply to Group Secretary, Memorial Hospital, Woolwich, S.E.18.

MOTHERS' HOSPITAL (Salvation Army), London, E.5. (Maternity—110 Beds.) Applications are invited from registered medical practitioners for the 6 months appointment, vacant 1st August, of RESIDENT OBSTETRIC HOUSE SURGEON (post recognised for M.R.C.O.G.).

Apply, with full details, to Group Secretary, Hackney Hospital, London, E.9.

NATIONAL HOSPITALS FOR NERVOUS DISEASES. Applications are invited for a full-time Medical Appointment in the E.E.G. Department of the Maida Vale Hospital for Nervous Diseases, London, W.9. The grade of the post is Registrar (salary £850/£965 p.a.) but applications will be considered from candidates already graded as Senior Registrars and who have completed their 4 years training or are not intending to specialise in this country. The salary range for a Senior Registrar is £1000–£1100–£1400 p.a. Candidates with experience in physiology need not have had previous clinical E.E.G. experience.

Applications, with copies of 3 recent testimonials, to be sent to the Secretary at Maida Vale Hospital not later than 11th July, 1955.

NELSON HOSPITAL, Kingston-road, Merton, S.W.20. HOUSE SURGEON (resident). Approved pre-registration post. Vacant 23rd July.

Applications, stating age, qualifications, &c., with the names and addresses of 2 referees, should be sent to the Secretary at above address.

QUEEN MARY'S HOSPITAL FOR THE EAST END, Stratford, London, E.15. JUNIOR CASUALTY OFFICER (Male or Female; House Officer third post) required for 6 months commencing as soon as possible.

Applications, with copies of recent testimonials, to Group Secretary, West Ham Group Hospital Management Committee, Stratford, E.15, by 9th July, 1955.

QUEEN MARY'S HOSPITAL FOR THE EAST END, Stratford, London, E.15. HOUSE PHYSICIAN (Male or Female; pre-registration post) required for 6 months commencing 7th August, 1955.

Applications, with copies of recent testimonials, to Group Secretary, West Ham Group Hospital Management Committee, Stratford, E.15, by 16th July, 1955.

QUEEN MARY'S HOSPITAL FOR THE EAST END, Stratford, London, E.15. HOUSE SURGEON (Male or Female; pre-registration post) required for 6 months commencing 11th August, 1955.

Applications, with copies of recent testimonials, to Group Secretary, West Ham Group Hospital Management Committee, Stratford, E.15, by 16th July, 1955.

ROYAL NATIONAL, THROAT, NOSE AND EAR HOS-PITAL, Gray's Inn-road, W.C.1, and Golden-square, W.1. RESIDENT HOUSE SURGEON (post-registration post). Applications are invited for a 6 months appointment as from 1st August, 1955, with salary and conditions as laid down for House Officers in the terms and conditions of service in the National Health Service.

Applications, stating age, qualifications, full details of previous experience (particularly in this specialty), with copies of 1–3 recent testimonials, should be sent to the House Governor immediately.

ST. JAMES' HOSPITAL, Balham, S.W.12. House PHYSICIAN required end of July.

Applications, stating age, qualifications, experience, and names of 2 referees, to Group Secretary at above address by 8th July.

ST. LEONARD'S HOSPITAL, Nuttall-street, London, N.1. (192 Beds.) Applications are invited for the post of RESIDENT ANÆSTHETIST (Senior House Officer) with additional duties in the Group. The post is recognised for the D.A. Good opportunities will be given to study for higher qualifications.

Applications, with 2 recent testimonials, to the Hospital Secretary by 16th July, 1955.

ST. ANN'S GENERAL HOSPITAL, N.15. (756 Beds.) Applications are invited from registered medical practitioners for the appointment of RESIDENT HOUSE PHYSICIAN (Senior House Officer) for duty in the Infectious Diseases Unit and other general duties, for a period of 6 months commencing 5th August, 1955.

Application form from Secretary, Tottenham Group Hospital Management Committee, The Green, Tottenham, N.15, to be returned by 16th July, 1955.

ST. GEORGE'S HOSPITAL, S.W.1. Applications are invited for the post of HOUSE SURGEON, in the grade of Senior House Officer, to the Department of Thoracic Surgery. The successful candidate will be required to take up duty as soon as possible after 23rd July, 1955.

Applications, stating age, education, qualifications, experience, and the names of 2 referees, should reach the undersigned not later than 16th July, 1955.

P. H. CONSTABLE, House Governor.

ST. MARK'S HOSPITAL, City-road, London, E.C.1. Applications invited from Senior Registrars who have completed their training, or from Registrars who have completed their appointments, for the post of RESIDENT SURGICAL OFFICER. Part of time non-resident by arrangement. Salary at the rate of £1400 or £965 respectively. Appointment tenable for 6 months from 1st October, with possibility further extension 6 months.

Applications, stating age, qualifications, experience, names of 2 referees, to Secretary, Board of Governors, Hammersmith, West London and St. Mark's Hospitals, Ducane-road, London, W.12, by 11th July.

ST. MARY'S HOSPITAL, W.2. Applications are invited for the post of Part-time OUTPATIENT SURGICAL ASSISTANT for 6 notional half-days per week (Monday P.M., Wednesday A.M. and P.M., Friday A.M. and P.M., Saturday A.M.), graded Senior House Officer. The appointment will be for a first period of 12 months and the successful candidate will be required to commence duties as soon as possible.

Applications, stating nationality, date of birth, permanent address, qualifications with dates, details and National Health Service, gradings of previous and present appointments, together with the names and addresses of 3 referees, should reach ALAN POWDITCH, House Governor, by 13th July, 1955.

ST. NICHOLAS HOSPITAL, Plumstead, London, S.E.18. CASUALTY OFFICER. Recognised for F.R.C.S. 6 months resident appointment (not pre-registration). Salary £525 p.a., less £125 p.a. for residence. There is also a Senior House Officer in the department.

Apply to Group Secretary, Memorial Hospital, Woolwich, S.E.18.

ST. THOMAS'S HOSPITAL, London, S.E.1. Senior REGISTRAR to the Department of Anæsthetics required for a period of 1 year in the first instance.

Applications, including names and addresses of 2 referees, to the Clerk of the Governors by 23rd July, 1955.

SOUTH EAST REGIONAL THORACIC SURGERY UNIT. (46 Beds.) BROOK GENERAL HOSPITAL, Shooters Hill-road, S.E.18. SENIOR HOUSE OFFICER, vacant early August. Recognised for F.R.C.S. 6 months appointment and may be renewed for a further period. The Unit treats all types of chest diseases and offers opportunity for comprehensive training in thoracic surgery.

Apply to Group Secretary, Memorial Hospital, Woolwich, S.E.18.

UNIVERSITY COLLEGE HOSPITAL, Gower-street, W.C.1. Applications are invited from those proposing to attend the D.M.R. Conjoint Course starting in October, 1955, for a post of REGISTRAR grading in the X-ray Diagnostic Department. Preference will be given to those who have held a medical or surgical registrarship and who have a higher medical or surgical qualification.

Applications, with names of 2 referees, to Administrator and Secretary by 16th July, 1955.

UNIVERSITY COLLEGE HOSPITAL, Gower-street, W.C.1. Applications are invited for the post of REGISTRAR in the Department of Psychological Medicine for 1 year in the first instance.

Applications, with names of 2 referees, to Administrator and Secretary by 16th July, 1955.

UNIVERSITY COLLEGE HOSPITAL, Gower-street, W.C.1. Applications are invited for the post of RESIDENT SENIOR HOUSE OFFICER to the Anæsthetics Department from 1st September, 1955.

Applications, with names of 2 referees, to Administrator and Secretary by 16th July, 1955.

WANDSWORTH HOSPITAL GROUP. Senior House OFFICER (general surgery and genito-urinary) required 1st August. Recognised for the F.R.C.S.

Applications, stating age, qualifications, experience and names of 2 referees, to the Group Secretary, St. James' Hospital, Balham, S.W.12, by 13th July.

WILLESDEN GENERAL HOSPITAL, Harlesden-road, N.W.10. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. MEDICAL REGISTRAR (whole-time), non-resident, required at above Hospital. Hospital may be visited by direct appointment.

Application forms obtainable from, and returnable to, Group Secretary, Central Middlesex Group Hospital Management Committee, Acton-lane, N.W.10, by 13th July.

WOOLWICH GROUP HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (anæsthetics). 2 posts vacant early August at Memorial Hospital, Woolwich, and at St. Nicholas Hospital, Plumstead. Recognised for F.F.A.R.C.S. and D.A. 6 months appointment and may then be renewed. Salary £745 p.a., less £150 for residence.

Apply to Group Secretary, Memorial Hospital, Woolwich, S.E.18.

WANSTEAD HOSPITAL, Hermon-Hill, Wanstead, E.11. (191 Beds.) Applications are invited for the post of HOUSE PHYSICIAN, vacant 6th August, 1955.

Applications, with full details and copies of 2 recent testimonials, should be sent immediately to the Secretary, Forest Group, Hospital Management Committee, Langthorne-road, E.11.

WANSTEAD HOSPITAL, Hermon Hill, E.11. (191 Beds.) Applications are invited for the post of CASUALTY OFFICER graded Senior House Officer, vacant 8th July, 1955. Salary £745 p.a., less £150 p.a. for board, lodging, &c.

Applications, with full details and copies of 2 recent testimonials, should be sent immediately to the Secretary, Hospital Management Committee Forest Group, Langthorne-road, E.11.

WANSTEAD HOSPITAL, Hermon Hill, London, E.11. (191 Beds.) HOUSE SURGEON required. Post vacant now. Recognised for F.R.C.S.

Applications, with full details and copies of 2 recent testimonials, should be sent immediately to Secretary, Forest Group Hospital Management Committee, Langthorne-road, E.11.

WEST HAM CHEST CLINIC, Balaam-street, Plaistow, E.13. Applications are invited for the part-time post of CLINICAL ASSISTANT at the above Chest Clinic—6 sessions per week. Applicants should have considerable experience in respiratory tuberculosis and diseases of the chest. The appointment is subject to review in 1 year. Remuneration at rate of £175 p.a. per session.

Applications, with names of 3 referees, to the Secretary, West Ham Group Hospital Management Committee, Stratford, London, E.15, by 8th July, 1955.

WESTMINSTER HOSPITAL, St. John's-gardens, S.W.1. Applications invited for post of REGISTRAR to Chemical Pathology Department for 1 year in first instance from 1st October, 1955.

Applications (4 copies), with names of 2 referees, to House Governor by 16th July.

WHITTINGTON HOSPITAL, N.19. Clinical Assistant (general practitioner) required at above Hospital to assist in skin outpatient clinic. 2 hours weekly (Tuesday morning).

Applications, giving name, age, qualifications and the name of 1 referee, to the Medical Superintendent, Whittington Hospital, Highgate Hill, N.19, not later than 11th July, 1955.

WIMBLEDON HOSPITAL, Thurston-road, S.W.20. (82 Beds.) RESIDENT HOUSE OFFICER (House Officer post—not pre-registration), vacant mid-July. Gives good general experience in acute medicine and surgery, including children.

Applications, stating full particulars of experience, &c., with copies of testimonials and the name of 1 referee, should be sent to the Secretary at above address.

ABERYSTWYTH GENERAL HOSPITAL. Mid Wales HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER at the above Hospital. Post recognised for F.R.C.S. Vacant on 1st August, 1955. The post is resident.

Applications, stating age, nationality, qualifications, and experience, accompanied by copies of 2 recent testimonials, should be sent to the Group Secretary, "Orlandon," North-parade, Aberystwyth, within 14 days from the publication of this advertisement.

AYLESBURY. STOKE MANDEVILLE HOSPITAL. RESIDENT HOUSE PHYSICIAN for the Department of Medicine. Recognised pre-registration post. Applications from registered practitioners will be considered. Post vacant immediately.

Apply, with copies of 2 testimonials, to Administrative Officer.

AYLESBURY, BUCKINGHAMSHIRE. STOKE MANDE-VILLE HOSPITAL. RESIDENT HOUSE PHYSICIAN for Neurological Unit (part of the Department of Neurology of the United Oxford Hospitals). Vacant 1st August. Pre-registration post but open to registered practitioners, in which case the status up to Senior House Officer may be awarded.

Apply, with copies of 2 testimonials, to Administrative Officer, as soon as possible.

BARNSTAPLE. NORTH DEVON INFIRMARY. (110 Beds.) HOUSE SURGEON (pre-registration). Post vacant mid-July.

Applications to Group Secretary, North Devon Hospital Management Committee, 19, Alexandra-road, Barnstaple.

BATH. ST. MARTIN'S HOSPITAL. Applications are invited from registered medical practitioners for the post of HOUSE PHYSICIAN (Senior House Officer grade) at above Hospital from 1st August, 1955.

Applications, stating age, qualifications, and experience with names of 2 referees, should be forwarded to Group Secretary, Bath Hospital Management Committee, Manor Hospital, Combe Park, Bath, by 11th July, 1955.

BATH. ST. MARTIN'S HOSPITAL. Applications are invited from registered medical practitioners for the post of HOUSE ANÆSTHETIST (Senior House Officer grade) at above Hospital from 1st September, 1955. Facilities will be made available for attending evening lectures, when held, at Bristol for the higher Diploma in Anæsthetics examination. The post is recognised under the F.F.A.R.C.S. and D.A. regulation.

Applications, stating age, qualifications, and experience, with names of 2 referees, should be forwarded to Group Secretary, Bath Hospital Management Committee, Manor Hospital, Combe Park, Bath, by 18th July, 1955.

BEDFORD GENERAL HOSPITAL. (437 Beds.) Locum CASUALTY OFFICER (Registrar grade) required pending permanent appointment. Salary £17 10s. per week.

Applications, stating age, nationality, qualifications, and previous appointments, together with copies of 2 recent testimonials, should be forwarded to Group Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford.

BEDFORD GENERAL HOSPITAL. (437 Beds.) Resident Pre-registration HOUSE PHYSICIAN required on 4th August.

Applications, stating age, nationality, qualifications, previous appointments (if any), together with copies of 2 recent testimonials, should be forwarded to Group Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford, by not later than 16th July, 1955.

BIRMINGHAM ACCIDENT HOSPITAL, Birmingham, 15. (215 Beds.) RESIDENT HOUSE SURGEON, vacant now. Recognised for F.R.C.S. Appointment for 6 months in General Accident Service and (at applicant's request) includes period in 32-Bedded Burns Unit.

Apply Administrator.

BIRMINGHAM EAR AND THROAT HOSPITAL, Edmund-street, BIRMINGHAM, 3. HOUSE OFFICER required. Pre-registration considered.

Detailed applications, with copies of 2 recent testimonials, to Secretary, Dudley Road Hospital, Birmingham, 18.

BIRMINGHAM, 18. DUDLEY ROAD HOSPITAL. (780 Beds.) 3 HOUSE SURGEONS required. Recognised for pre-registration and F.R.C.S. Each appointment in unit of approximately 85 adult and children's general surgical beds under control of 2 Consultant Surgeons. 1 vacant immediately, others 10th July and 1st August.

Detailed applications, with copies of 3 recent testimonials, to Secretary.

BIRMINGHAM, 18. DUDLEY ROAD HOSPITAL. (780 Beds.) PÆDIATRIC HOUSE PHYSICIAN required. Recognised for pre-registration and D.C.H. Department under direction of 2 Consultant Paediatricians. 88 paediatric beds or cots and 100 neonatal cots. Facilities given for postgraduate instruction and necessary attendance at clinics. University Undergraduates attend for Clinical instruction. Vacant 25th July.

Detailed applications, with copies of 3 recent testimonials, to Secretary.

BIRMINGHAM REGIONAL HOSPITAL BOARD.

(1) **Birmingham (Selly Oak) Group, Oak Tree-lane, Birmingham, 29**

SURGICAL REGISTRAR for Birmingham Accident Hospital (215 Beds). Special experience available in treatment of shock and infection, and principles of plastic surgery in connection with Medical Research Council Burns Unit. Previous experience not essential. F.R.C.S. advantageous.

(2) **No. 20 Group, Stoney Stanton-road, Coventry**

(*a*) REGISTRAR in General Surgery.

(*b*) REGISTRAR in Orthopædic Surgery, for Hospital of St. Cross, Rugby (156 Beds), vacant 31st August. Experience specialty essential. Higher qualification desirable. Recognised F.R.C.S. Resident.

(3) **West Bromwich Group, Edward-street, West Bromwich**

Whole-time REGISTRAR in General Surgery. Duties in Casualty Department. Opportunity to deputise for Resident Surgical Officer in general surgery work. Recognised F.R.C.S. Experience specialty required. Resident.

Application forms from Group Secretaries, to be returned before 18th July, 1955. Candidates may visit hospitals.

BIRMINGHAM. THE SKIN HOSPITAL, INPATIENTS' DEPARTMENT, George-road, BIRMINGHAM, 15. SENIOR HOUSE OFFICER or HOUSE OFFICER according to experience (required mid-August). Modern well-equipped Inpatients' Department, providing facilities for study of skin diseases. Required to assist Consultant at outpatient clinics.

Applications, with copies of 2 recent testimonials, to Secretary, Dudley Road Hospital, Birmingham, 18.

BIRMINGHAM. THE UNITED BIRMINGHAM HOS-PITALS. THE QUEEN ELIZABETH HOSPITAL. Applications are invited for the post of RESIDENT CLINICAL PATHOLOGIST (Senior House Officer) in the Department of Bacteriology and Clinical Pathology. This officer will act as one of 3 blood bank officers in addition to routine work in the department. Previous experience in clinical pathology is not essential but applicants should have had hospital postgraduate experience. The appointment is tenable for 1 year.

Application forms may be obtained from the Secretary, United Birmingham Hospitals, Queen Elizabeth Hospital, Birmingham, 15, and should be returned to him not later than 9th July, 1955.

BIRMINGHAM. THE UNITED BIRMINGHAM HOS-PITALS. Applications are invited for the appointment of NON-RESIDENT REGISTRAR (E.N.T. Department) for duties within the United Hospitals, including the Children's Hospital. Applicants should have had previous experience in the specialty, and a higher qualification is desirable.

Forms of application may be obtained from the Secretary, United Birmingham Hospitals, Queen Elizabeth Hospital, Edgbaston, Birmingham, 15, and should be returned not later than 9th July, 1955.

BRADFORD. ST. LUKE'S HOSPITAL. Senior House OFFICER (anæsthetics), vacant 8th August. Salary £745 p.a., less £150 p.a. residential emoluments. Opportunities for plastic and intra-thoracic experience and recognised for D.A. and F.F.A.R.C.S.

Applications, stating age, nationality, qualifications, and experience, with copy testimonials, to Secretary, Bradford Royal Infirmary.

BRADFORD. ST. LUKE'S HOSPITAL AND WOOD-LANDS HOSPITAL, RAWDON, near LEEDS.

SENIOR HOUSE OFFICER to Orthopædic Unit, with duties at both hospitals, vacant now. Salary £745 p.a., less £150 p.a. residential emoluments.

JUNIOR HOUSE OFFICER to Orthopædic Unit with duties at both hospitals, vacant now. Salary £425–£525 p.a., less £125 p.a. residential emoluments.

Applications, stating age, nationality, qualifications and experience with copy testimonials, to the Secretary, Bradford Royal Infirmary.

BRADFORD. ROYAL EYE AND EAR HOSPITAL. HOUSE SURGEON (ophthalmology), vacant 16th July. Recognised for D.O.M.S. and F.R.C.S. Salary according to Whitley Council (MDB) rates.

Applications, stating age, nationality, qualifications, and experience, with copy testimonials, to Secretary, Bradford Royal Infirmary.

BISHOP AUCKLAND GENERAL HOSPITAL. (350 Beds.) SOUTH WEST DURHAM HOSPITAL MANAGEMENT COMMITTEE. RESIDENT ANÆSTHETIST (Senior House Officer) required.

Apply, naming 2 referees, to—

K. G. T. LUXFORD, Group Secretary/Finance Officer.

The General Hospital, Bishop Auckland, co. Durham.

BISHOP'S STORTFORD AND DISTRICT HOSPITAL, Rye-street, BISHOP'S STORTFORD, HERTS. (67 Beds—medical, surgical and maternity. Midway between London and Cambridge. Main Line Railway from Liverpool Street.) Applications are invited from registered medical practitioners for the appointment of RESIDENT SENIOR HOUSE OFFICER. Appointment to commence as soon as possible. Salary £745 p.a.

Applications, stating age, nationality, qualifications and experience, with copies of recent testimonials or names of referees, should be sent to the Hospital Secretary, Haymeads Hospital, Bishop's Stortford, Herts.

BLACKBURN (near). CALDERSTONES HOSPITAL, WHALLEY, near BLACKBURN, LANCASHIRE. (For Mental Defectives: 2378 Beds.) CALDERSTONES HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of JUNIOR HOSPITAL MEDICAL OFFICER. Salary scale £775–£50–£1075. Health Service conditions of service and superannuation scheme. Unfurnished house available for rent to married man; residential quarters available for single man.

Applications, stating age, qualifications, and experience, together with the names and addresses of 3 referees, to be submitted to the Medical Superintendent, Calderstones Hospital, Whalley, near Blackburn, as soon as possible.

BLACKBURN AND DISTRICT HOSPITAL MANAGE-MENT COMMITTEE. SENIOR HOUSE OFFICER (obstetrics and gynæcology). Recognised for M.R.C.O.G. and D.Obst. R.C.O.G. (combined obstetrics and gynæcology). Based on Queen's Park Hospital, Blackburn (a general hospital with 83 obstetric/gynæcological beds) with duties at Royal Infirmary, Blackburn, and occasionally at Victoria Hospital, Accrington.

Applications, with names of 2 referees or copies of testimonials, to Secretary, Hospital Management Committee Office, Royal Infirmary, Blackburn.

BLACKPOOL. VICTORIA HOSPITAL. (348 Beds.) THE MANCHESTER REGIONAL HOSPITAL BOARD invite applications from registered practitioners for appointment on the staff of the Department of Thoracic Surgery. The successful applicant will be graded either REGISTRAR or SENIOR HOUSE OFFICER according to qualifications and experience. The post offers excellent opportunities for gaining experience in a Consultant staffed hospital and department.

Applications, together with the names of 2 referees or references, should be sent to the Group Secretary, Victoria Hospital, Blackpool.

BRIGHTON, 7. BEVENDEAN HOSPITAL, Bear-road. (165 Beds.) Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER at the above Hospital for Chest Diseases. The post will include some duties at Chest Clinics in the area. Salary at the rate of £775–£50–£1075 p.a.

Applications, stating age, qualifications, nationality, previous posts held, together with the names of 2 referees, should be sent to the Secretary, Brighton and Lewes Hospital Management Committee, Royal Sussex County Hospital, Brighton, 7, by 11th July.

BRIGHTON. NEW SUSSEX HOSPITAL FOR WOMEN, Windlesham-road. HOUSE PHYSICIAN (Female) for 6 months from 9th July. Duties include work in Gynæcological Department. Pre-registration candidates may apply.

Applications, stating age, nationality, qualifications and experience, together with copies of recent testimonials, to the Administrative Officer as soon as possible.

BRIGHTON. SUSSEX EYE HOSPITAL, Eastern-road, BRIGHTON, 7. (56 Beds.) SENIOR HOUSE SURGEON (Senior House Officer) required. Recognised for F.R.C.S. and D.O.

Applications, stating age, qualifications and experience, and naming 2 referees, to the Administrative Officer, Royal Sussex County Hospital, Brighton, 7.

BRISTOL. THE BOARD OF GOVERNORS OF THE UNITED BRISTOL HOSPITALS AND THE SOUTH-WESTERN REGIONAL HOSPITAL BOARD. Applications are invited by the above Boards from registered medical practitioners for the joint appointment of SENIOR REGISTRAR in Psychiatry to the Plymouth Clinical Area based on Moorhaven Hospital, Ivybridge, South Devon. The appointment will be for a period of 1 year in the first instance, renewable annually up to a maximum of 4 years. An excellent maisonette is available suitable for a married man with children. The post offers opportunities in all branches of inpatient and outpatient clinical work including neurology, mental deficiency, and child guidance. The outpatient service is based on the South Devon and East Cornwall Hospital, Plymouth, and the Plymouth Child Guidance Clinic. Experience can be gained in the principles and practice of psychotherapy under supervision as well as in the physical methods of treatment, and half the time given to outpatient work is devoted to treatment. Moorhaven Hospital is recognised as a training centre for the D.P.M. A copy of the 1954 Annual Report and further particulars can be obtained from the Physician-Superintendent, Moorhaven Hospital.

Applications, stating date of birth, qualifications and experience, together with the names and addresses of 2 referees, should be sent to the Secretary of the Regional Hospital Board, 27, Tyndalls Park-road, Bristol, 8, not later than 16th July, 1955.

BRISTOL-COSSHAM/FRENCHAY HOSPITAL MANAGEMENT COMMITTEE. FRENCHAY HOSPITAL. (513 staffed beds, expanding.) Applications are invited for the post of SENIOR HOUSE OFFICER in the regional Neurosurgery Department, vacant end of July. This post offers useful surgical experience and the opportunity of gaining a working knowledge of neurological diagnosis. Recognised for F.R.C.S.

Applications to the Secretary, Frenchay Hospital, quoting "N.S.F." Names of 2 referees required.

BRISTOL. UNITED BRISTOL HOSPITALS. Royal INFIRMARY BRANCH. Applications are invited for the resident post of SENIOR CASUALTY HOUSE SURGEON (Senior House Officer grade), tenable for 6 months from 1st September, 1955.

Applications, on forms to be obtained from the Secretary to the Board, Royal Infirmary Branch, Bristol, 2, should be returned by 16th July, 1955.

BRISTOL. UNITED BRISTOL HOSPITALS. SOUTH-WESTERN REGIONAL HOSPITAL BOARD. REGISTRARS in Diagnostic Radiology. Applications are invited for 3 half-time Registrarships jointly to the above Boards. These posts are intended as training posts and are open to candidates accepted for the University of Bristol Course in Diagnostic Radiology. (See separate advertisement.) The appointments are available for 1 year in the first instance, from 1st October, 1955, and are renewable for a second year. The duties will be integrated with the University Course of Instruction.

Applications, with names of 2 referees, should be sent not later than 9th July, 1955, to the Director of Radiology, Royal Infirmary, Bristol, 2.

BROMLEY HOSPITAL, Bromley, Kent. Senior House OFFICER (in charge Casualty Department) required for 6 months from 1st August, 1955. Recognised for F.R.C.S. Deduction of £150 p.a. for residence.

Apply, stating age, qualifications with dates, previous experience, and naming 3 referees, to Administrative Officer.

CAERNARVON AND ANGLESEY HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the following posts :—

HOUSE SURGEON—Caernarvon and Anglesey General Hospital, Bangor.

HOUSE SURGEON—Llandudno General Hospital.

The appointments are for a period of 6 months. Salary and conditions of service in accordance with those approved by the Ministry of Health.

Applications, stating age, qualifications and experience, together with the names and addresses of 2 referees, to be forwarded to the Group Secretary, Plas Gwyn, Ffriddoedd-road, Bangor, within 10 days of appearance of this advertisement.

CAMBRIDGE. ADDENBROOKE'S HOSPITAL. 2 House PHYSICIANS, each for 6 months. 1 from 1st September, other from 15th September. Recognised Pre-registration Service.

Apply, stating age, nationality, qualifications and experience with dates, and copies of 3 testimonials, to Secretary by 16th July. Interviews towards end July.

CANTERBURY. KENT AND CANTERBURY HOSPITAL. (276 Beds.) GYNÆCOLOGICAL HOUSE SURGEON required at Highland Court Annexe, a unit of 25 gynæcological beds situated 3 miles from the above Hospital, with all ancillary services available. Recognised for M.R.C.O.G. 6 months appointment. Post now vacant. National Health Service salary and conditions.

Applications, together with copies of 2 recent testimonials, to be addressed to the Hospital Secretary at the above Hospital.

CARDIFF ISOLATION HOSPITAL. Senior House OFFICER (resident) required at above Hospital.

Apply immediately to Group Secretary, Cardiff Hospital Management Committee, 44, Cathedral-road, Cardiff.

CARLISLE. CUMBERLAND INFIRMARY. Applications are invited for 3 HOUSE OFFICER appointments—General Surgery, for the 6 months period commencing 1st August, 1955. The posts are recognised for pre-registration purposes.

Applications, stating age, giving details of education, training and experience, together with the names of 2 referees, should be sent to the Secretary, Cumberland Infirmary, Carlisle, as soon as possible.

CARMARTHEN. WEST WALES GENERAL HOSPITAL. (188 Beds. Recognised by the Royal College of Surgeons and for Pre-registration Service.) **WEST WALES HOSPITAL MANAGEMENT COMMITTEE.** Applications are invited for the post of Locum Tenens SENIOR HOUSE OFFICER or HOUSE OFFICER (surgical). Senior House Officer salary—£14 10s. per week or House Officer £9 10s. per week (less residential emoluments). Locum required immediately until end of July.

Applications, stating age, qualifications, experience and nationality, with names and addresses of 3 referees, to the Group Secretary, West Wales Hospital Management Committee, Glangwili, Carmarthen.

CARMARTHEN. WEST WALES GENERAL HOSPITAL. (188 Beds. Recognised by the Royal College of Surgeons and for Pre-registration Service.) **WEST WALES HOSPITAL MANAGEMENT COMMITTEE.** Applications are invited for the post of RESIDENT HOUSE OFFICER (medical) which will become vacant at the beginning of August next. Salary and conditions of service as laid down by the Ministry of Health.

Applications, stating age, qualifications, experience, nationality, with names and addresses of 3 referees, to the Group Secretary, West Wales Hospital Management Committee, Glangwili, Carmarthen.

CARSHALTON, SURREY. ST. HELIER HOSPITAL. CASUALTY OFFICER (Senior House Officer), vacant mid-July.

Applications, stating age, qualifications and experience, with copies of recent testimonials and the names of 2 referees, should be sent as soon as possible to the Group Secretary at the above address.

CARSHALTON. QUEEN MARY'S HOSPITAL FOR CHILDREN. (Acute Children's Hospital of 818 Beds.) Whole-time REGISTRAR required for surgical and orthopædic duties. Position vacant latter part of August. Applicants are invited to visit the Hospital by appointment with the Physician-Superintendent.

Applications, on forms obtainable from the Group Secretary, should be submitted by 23rd July, 1955.

CASTLEFORD, NORMANTON AND DISTRICT HOSPITAL. RESIDENT SURGICAL OFFICER required. Graded Senior House Officer. Married accommodation available.

Applications to Secretary, Gt. Northern House, Salter-row, Pontefract, Yorks.

CHELMSFORD HOSPITAL MANAGEMENT COMMITTEE. Resident Locum Tenens REGISTRAR to the Department of Pathology in Chelmsford from the middle of August. Previous experience in pathology essential. Higher qualifications not necessary.

Apply Secretary, Chelmsford Hospital Management Committee, London-road, Chelmsford.

CHELMSFORD AND ESSEX HOSPITAL. Locum Tenens REGISTRAR in Surgery required to work at the above Hospital for period 30th July–27th August. Preference will be given to applicants holding F.R.C.S.

Applications to the Secretary, Chelmsford Hospital Management Committee, London-road, Chelmsford.

CHELMSFORD AND ESSEX HOSPITAL. (162 Beds.) Applications are invited for the post of RESIDENT HOUSE SURGEON (pre-registration post). The post will become vacant on 13th July and offers good surgical experience and is recognised for the F.R.C.S.

Applications, together with 2 recent testimonials, to the Secretary, Chelmsford Hospital Management Committee, London-road, Chelmsford.

CHELMSFORD. ST. JOHN'S HOSPITAL. (70 surgical beds.) Applications are invited for the appointment of RESIDENT SURGICAL OFFICER (Senior House Officer grade) at above Hospital. The post which becomes vacant on 1st September, 1955, is recognised for the F.R.C.S. and the successful candidate will gain excellent practical experience in general surgery, with good opportunity for preparation for higher qualifications. A House Surgeon is in residence.

Applications, stating age, nationality, present appointment and previous appointments, both with dates, together with the names and addresses of 2 referees, to be sent to the Group Secretary, Chelmsford Hospital Management Committee, Chelmsford and Essex Hospital, London-road, Chelmsford.

CHEPSTOW, MONMOUTHSHIRE. PLASTIC SURGERY JAW INJURIES AND BURNS CENTRE, ST. LAWRENCE HOSPITAL. (100 plastic surgery, 50 orthopædic beds.) SENIOR HOUSE OFFICER in Plastic Surgery required. Previous experience in specialty not essential. The successful candidate will receive a thorough training in plastic surgery and burns. Hospital intakes from most of Wales and provides extensive experience. There is another Senior House Officer in plastic surgery and also a Senior House Officer in orthopædics. Salary £745, less £150 board-residence.

Write, quoting 2 referees, to T. A. JONES, Group Secretary. 64, Cardiff-road, Newport, Mon.

CHESTER-LE-STREET. GENERAL HOSPITAL. (204 Beds.) HOUSE OFFICER (general medicine). Post vacant 1st August, 1955. Recognised for pre-registration purposes.

Applications, with names of 2 referees, to Group Secretary, Dryburn Hospital, Durham.

CHESTER-LE-STREET. GENERAL HOSPITAL. (204 Beds.) HOUSE OFFICER (general surgery). Post vacant 1st August, 1955. Recognised for pre-registration purposes.

Applications, with names of 2 referees, to Group Secretary, Dryburn Hospital, Durham.

COULSDON, SURREY. CANE HILL HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR in Psychiatry, whole-time, resident (if unmarried) or non-resident. The hospital has 4 outpatient clinics and undertakes postgraduate teaching in association with the Institute of Psychiatry. Candidates should have had previous general and psychiatric hospital experience. Every facility will be given for further study. Candidates may visit the Hospital by arrangement with the Physician-Superintendent.

Application forms, returnable within 14 days, may be obtained from the Group Secretary.

COVENTRY AND WARWICKSHIRE HOSPITAL. (354 Beds.) SENIOR HOUSE OFFICER in Orthopædic Surgery (60 Beds). Resident.

Applications to Secretary, Group 20 Hospital Management Committee, Stoney Stanton-road, Coventry.

CROYDON GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. ORTHOPÆDIC REGISTRAR (whole-time), resident or non-resident, for duties involving both orthopædic and fracture work mainly at Mayday Hospital (618 Beds). Previous orthopædic experience essential and possession of higher surgical qualification desirable. Post vacant 14th September.

Application forms obtainable from GEORGE A. PAINES, Secretary, Hospital Management Committee, General Hospital, Croydon, to be returned not later than 13th July.

CROYDON. MAYDAY HOSPITAL. (618 Beds.) Croydon GROUP HOSPITAL MANAGEMENT COMMITTEE. JUNIOR CASUALTY OFFICER (Senior House Officer grade). Applications are invited for post which is vacant immediately. Recognised for Final F.R.C.S. examination. Particularly good for gaining experience in orthopædics and fracture work.

Application forms obtainable from GEORGE A. PAINES, Group Secretary, Hospital Management Committee, General Hospital, Croydon.

CROYDON GENERAL HOSPITAL. (200 Beds.) Croydon GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. SENIOR CASUALTY OFFICER (Registrar status). Post vacant. Busy department. Post recognised for Final F.R.C.S. examination.

Application forms obtainable from GEORGE A. PAINES, Group Secretary, Hospital Management Committee, General Hospital, Croydon, to be returned within 14 days.

COLCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for :—

Essex County Hospital, Colchester (188 Beds)

HOUSE OFFICER (surgical). First, second, third, or pre-registration post ; tenable for 6 months.

Black Notley Hospital, Braintree, Essex (544 Beds)

HOUSE OFFICER (orthopædic surgery). First, second, third, or pre-registration post ; tenable for 6 months. Recognised for F.R.C.S.

Black Notley Hospital, Braintree, and Essex County Hospital, Colchester

HOUSE SURGEON (first, second, third, or pre-registration post), tenable for 6 months. Duties to include work in general surgical and gynæcological wards. Recognised for F.R.C.S.

Essex County Hospital, Colchester (19 gynæcological beds) **Colchester Maternity Hospital** (22 obstetric beds)

HOUSE OFFICER (Male or Female), obstetric and gynæcological. First, second, third, or pre-registration post ; tenable for 6 months.

Applications, with copies of 3 testimonials, to Group Secretary, 14, Pope's-lane, Colchester, Essex.

COLCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for :—

Essex County Hospital, Colchester (189 Beds)

SENIOR HOUSE OFFICER (anæsthetics). Post tenable for 1 year. Recognised for D.A. The successful candidate will be called upon to give anæsthetics in other hospitals in the Group.

Harwich and District Hospital, Dovercourt (30 Beds)

SENIOR HOUSE OFFICER. Duties mainly surgical, but there is a proportion of medical beds. In addition there are surgical, medical, E.N.T. outpatient and casualty work. Post tenable for 1 year.

Applications, with copies of 3 testimonials, to Group Secretary, 14, Pope's-lane, Colchester, Essex.

DENBIGH. THE NORTH WALES HOSPITAL FOR NERVOUS AND MENTAL DISORDERS. JUNIOR HOSPITAL MEDICAL OFFICER or SENIOR HOUSE OFFICER required. A house on the Hospital estate, or single quarters, available. The Hospital has modern treatment facilities, and is recognised by the Conjoint Board for the purpose of their D.P.M. examination.

Applications, with names of 2 referees, to the Medical Superintendent.

S. L. FROST, Secretary to the Management Committee.

DERBY. CITY HOSPITAL. House Physician (pre-registration) or SENIOR HOUSE OFFICER, vacant end of July.

Apply, stating full details with copies of 2 recent testimonials, to the Medical Superintendent, as soon as possible.

DERBY. DERBYSHIRE ROYAL INFIRMARY. Senior HOUSE OFFICER (casualty), vacant 10th July, 1955. Recognised for F.R.C.S.

Apply, with copies of 2 testimonials, to Secretary.

DERBY. DERBYSHIRE ROYAL INFIRMARY. House PHYSICIAN (pre-registration), vacant 7th August, 1955.

Apply, with copies of 2 testimonials, to Secretary.

DERBY. DERBYSHIRE ROYAL INFIRMARY. Senior HOUSE OFFICER (general surgery), vacant 18th July.

Apply, with copies of 2 recent testimonials, to Hospital Secretary.

DERBY. DERBYSHIRE ROYAL INFIRMARY. (396 Beds.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time NON-RESIDENT REGISTRAR (dermatology) required. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 11th July, 1955, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

DERBY. DERBYSHIRE ROYAL INFIRMARY. Resident SENIOR HOUSE OFFICER (Orthopædic and Accident Service), vacant 22nd July, 1955. Recognised for F.R.C.S.

Apply, with full details and copies of 2 testimonials, to Hospital Secretary.

DERBY. DERBYSHIRE ROYAL INFIRMARY. Senior HOUSE OFFICER (anæsthetics), vacant 1st August, 1955. Recognised for D.A.

Apply, stating full particulars, with copies of 2 testimonials, to Hospital Secretary.

DORCHESTER. DORSET COUNTY HOSPITAL. Obstetrical AND GYNÆCOLOGICAL HOUSE SURGEON required. Post vacant early August. Modern maternity centre dealing with majority of obstetrical emergencies in N.W. Dorset. Post tenable for 6 months and recognised for D.Obst.R.C.O.G.

Applications, stating age, experience, qualifications, and nationality, together with copy testimonials, to Group Secretary, West Dorset Hospital Management Committee, Damers-road, Dorchester, immediately.

DURHAM. DRYBURN HOSPITAL. (305 Beds.) **House** OFFICER (general medicine). Post vacant 1st August, 1955. Recognised for pre-registration purposes.

Applications, with names of 2 referees, to Group Secretary, Dryburn Hospital, Durham.

DURHAM. DRYBURN HOSPITAL. (305 Beds.) **House** OFFICER (general surgery). Post vacant 1st August, 1955. Recognised under F.R.C.S. regulations and for pre-registration purposes.

Applications, with names of 2 referees, to Group Secretary, Dryburn Hospital, Durham.

DONCASTER ROYAL INFIRMARY. (Recognised under the regulations for the Fellowship and D.L.O.) DONCASTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER in the E.N.T. Department. Post vacant now.

Applications to the Secretary to the Committee at the Doncaster Royal Infirmary.

DUDLEY, STOURBRIDGE AND DISTRICT HOSPITAL GROUP, BIRMINGHAM REGION.

The Corbett Hospital, Stourbridge (106 Beds)

SENIOR HOUSE OFFICER (casualty).

HOUSE OFFICER (surgical), pre-registration.

The Guest Hospital, Dudley (154 Beds)

SENIOR HOUSE OFFICER (casualty). Post recognised for F.R.C.S. examination.

HOUSE OFFICER (surgical), pre-registration. Post vacant now.

Wordsley Hospital, near Stourbridge (478 Beds)

SENIOR HOUSE OFFICER (anæsthetics). Resident. Previous experience house appointments essential. Experience available general surgery, gynæcology, orthopædics, plastic surgery unit.

SENIOR HOUSE OFFICER (medical). Post vacant July.

Applications, stating age, experience, with copies of 3 recent testimonials, to Group Secretary, The Guest Hospital, Dudley, Worcs.

EAST ANGLIAN REGIONAL HOSPITAL BOARD.

(1) MEDICAL REGISTRAR, East Suffolk and Ipswich Hospital. Post provides wide experience in general medicine. Single quarters available. Appointment for 1 year, renewable for second year. Candidates invited to visit Hospital by direct arrangement with Hospital Management Committee Secretary.

(2) SURGICAL REGISTRAR, North Cambridgeshire Hospital, Wisbech. Post provides good training and experience in both general and orthopædic surgery. Appointment for 1 year, renewable for second year. Candidates invited to visit Hospital by direct arrangement with Hospital Management Committee Secretary at the Hospital.

Applications, stating age, experience and names of 3 referees, to Secretary of Board, 117, Chesterton-road, Cambridge, by 18th July, 1955.

EDGWARE GENERAL HOSPITAL, Edgware, Middlesex. (715 Beds.) 2 RESIDENT OBSTETRIC HOUSE SURGEONS for above Hospital. Posts vacant 6th and 31st August, 1955. 6 months appointments. Posts recognised for M.R.C.O.G. purposes.

Applications, stating age, qualifications, experience, and enclosing copies of up to 3 recent testimonials, to Medical Director of Hospital by 16th July, 1955.

EDGWARE GENERAL HOSPITAL, Edgware, Middlesex. (715 Beds.) RESIDENT HOUSE SURGEON (general and genito-urinary surgery) for above Hospital. Post vacant 6th August, 1955. 6 months appointment. Post recognised for F.R.C.S. and pre-registration purposes.

Applications, stating age, qualifications, experience, and enclosing copies of up to 3 recent testimonials, to Medical Director of Hospital by 16th July, 1955.

EDGWARE GENERAL HOSPITAL, Edgware, Middlesex. (715 Beds.) RESIDENT HOUSE PHYSICIAN for above Hospital. Post vacant 24th August, 1955. 6 months appointment. Post recognised for pre-registration purposes.

Applications, stating age, qualifications, experience, and enclosing copies of up to 3 recent testimonials, to Medical Director of Hospital by 16th July, 1955.

ENFIELD, MIDDLESEX. CHASE FARM HOSPITAL. ENFIELD GROUP HOSPITAL MANAGEMENT COMMITTEE. Locum REGISTRAR in Orthopædics required 15th–28th August, 1955. Non-resident.

Apply Group Secretary with names of 2 referees.

EPPING. ST. MARGARET'S HOSPITAL. (485 Beds.) SENIOR HOUSE OFFICER (resident) required for Chest Department and to act as Second Resident Anæsthetist. Good opportunity for experience in modern methods. Previous experience in chest diseases desirable but not essential.

Applications, with references, to reach Group Secretary, St. Margaret's Hospital, Epping, Essex, by 15th July.

GLASGOW ROYAL INFIRMARY. Senior House Officer in Anæsthetics. Duties at above Infirmary.

Write, giving 3 names for reference, not later than 9th July, 1955, to the Secretary, Board of Management for Glasgow Royal Infirmary and Associated Hospitals, 135, Buchanan-street, Glasgow, C.1.

GLASGOW ROYAL INFIRMARY. Senior House Officer in Radiodiagnosis. Duties at above Infirmary.

Write, giving 3 names for reference, not later than 15th July, 1955, to the Secretary, Board of Management for Glasgow Royal Infirmary and Associated Hospitals, 135, Buchanan-street, Glasgow, C.1.

GLASGOW, N.1. STOBHILL GENERAL HOSPITAL. In the term beginning 1st August, vacancies for HOUSE OFFICERS (pre-registration) exist in the following units : Medicine (Acute Geriatrics), Dermatology.

Applications, giving the names of 2 referees, should be addressed to the Medical Superintendent.

GLASGOW, N.1. STOBHILL GENERAL HOSPITAL. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER in the acute Geriatric Unit (70 Beds—for assessment and rehabilitation) supervised by a Consultant Physician specialising in geriatrics. The appointment offers excellent clinical experience in the diagnosis and treatment of acute and other illnesses in the elderly and will be for 2 years in the first instance.

Applications, stating age, qualifications and experience, with the names of 2 referees, to be sent to the Medical Superintendent.

GLASGOW, N.1. STOBHILL GENERAL HOSPITAL. PSYCHIATRIC UNIT. HOUSE OFFICERS (resident), Male or Female, required 1st August, 1955. 180 Beds. 1500 admissions yearly, acute treatable cases. Unit recognised for D.P.M.

Apply to Medical Superintendent.

GLASGOW. GARTLOCH HOSPITAL. Senior House OFFICER required for Medical Unit (128 Beds—general medical cases). Salary £745 p.a. Married quarters may be available.

Applications, stating age, qualifications and experience, with 2 testimonials or names of 2 referees, to the Medical Superintendent.

GLASGOW NORTH-EASTERN MENTAL HOSPITALS BOARD OF MANAGEMENT require RESIDENT JUNIOR HOSPITAL MEDICAL OFFICER for Gartloch Mental Hospital, Gartcosh, Glasgow. Salary £775–£50–£1075 p.a. Married quarters may be available. Hospital may be seen by appointment with Medical Superintendent.

Applications, stating age, qualifications, training and experience, and names of 2 referees, to be sent to the Secretary and Treasurer, 2154, Gartloch-road, Gartcosh, Glasgow.

GREAT YARMOUTH AND GORLESTON GENERAL HOSPITAL, DENE SIDE, GREAT YARMOUTH. HOUSE PHYSICIAN required. Post vacant 1st August, 1955. The post is a pre-registration post at a salary of £425, £475, or £525 p.a. according to experience, less £125 p.a. for residence. Membership of a Medical Defence Society is a condition of appointment.

Applications, stating age, qualifications and experience, with names of 2 referees, to Hospital Secretary.

GREAT YARMOUTH AND GORLESTON GENERAL HOSPITAL, DENE SIDE, GREAT YARMOUTH. HOUSE SURGEON (Male or Female) required. Post vacant 1st August, 1955. The Hospital is staffed by a Consultant General Surgeon and a Consultant E.N.T. Surgeon, and is regularly visited by Consultant staff from the Norfolk and Norwich Hospital. The post is a pre-registration post at a salary of £425, £475, or £525 p.a. according to experience, less £125 p.a. for residence. Membership of a Medical Defence Society is a condition of appointment.

Applications, stating age, qualifications and experience with names of 2 referees, to Hospital Secretary.

HALIFAX. NORTHOWRAM HALL HOSPITAL. (108 Beds.) SENIOR HOUSE OFFICER in Chest Diseases required. Duties include attendance at busy chest clinic at the Royal Halifax Infirmary and non-tuberculous chest ward work at the Halifax General Hospital. This is a new appointment offering excellent facilities for the study of chest diseases. Salary £745 p.a., with deduction of £130 p.a. for board, residence, &c.

Apply to the Group Secretary, Royal Halifax Infirmary, Halifax.

HALIFAX. ROYAL HALIFAX INFIRMARY. (301 Beds.) SENIOR HOUSE OFFICER in Casualty and Orthopædic Surgery required. Post recognised for F.R.C.S. Salary £745 p.a., with deduction of £130 p.a. for board, residence, &c.

Apply to the Group Secretary, Royal Halifax Infirmary, Halifax.

HALIFAX. ROYAL HALIFAX INFIRMARY. (301 Beds.) SENIOR HOUSE OFFICER in Anæsthetics required. Post now vacant. Salary £745 p.a., with deduction of £130 p.a. for board, residence, &c.

Apply to the Group Secretary, Royal Halifax Infirmary, Halifax.

HALIFAX. ST. JOHN'S HOSPITAL. (382 Beds.) Senior HOUSE OFFICER in Geriatrics and General Medicine required. Post vacant early July. Salary £745 p.a., with deduction of £130 p.a. for board, residence, &c.

Applications to the Group Secretary, Royal Halifax Infirmary, Halifax.

HAVERFORDWEST. PEMBROKE COUNTY WAR MEMORIAL HOSPITAL. (163 Beds. Recognised by the Royal College of Surgeons and for Pre-registration Service.) WEST WALES HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT HOUSE OFFICER (surgical) which will become vacant at the end of July next. Salary and conditions of service as laid down by the Ministry of Health.

Applications, stating age, qualifications, experience, nationality, with names and addresses of 3 referees, to the Group Secretary, West Wales Hospital Management Committee, Glangwili, Carmarthen.

HAVERFORDWEST. PEMBROKE COUNTY WAR MEMORIAL HOSPITAL. (163 Beds. Recognised by the Royal College of Surgeons and for Pre-registration Service.) WEST WALES HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT SENIOR HOUSE OFFICER (surgical) which will become vacant at the end of July next. Salary and conditions of service as laid down by the Ministry of Health.

Applications, stating age, qualifications, experience, nationality, with names and addresses of 3 referees, to the Group Secretary, West Wales Hospital Management Committee, Glangwili, Carmarthen.

HAVERFORDWEST. PEMBROKE COUNTY WAR MEMORIAL HOSPITAL. (163 Beds. Recognised by the Royal College of Surgeons and for Pre-registration Service.) WEST WALES HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT HOUSE OFFICER (medical) which will become vacant at the end of July next. Salary and conditions of service as laid down by the Ministry of Health.

Applications, stating age, qualifications, experience, nationality, with names and addresses of 3 referees, to the Group Secretary, West Wales Hospital Management Committee, Glangwili, Carmarthen.

HEMEL HEMPSTEAD, HERTFORDSHIRE. WEST HERTS HOSPITAL. HOUSE SURGEON (pre-registration). Post vacant 18th July, 1955.

Applications, mentioning 2 names for reference should be sent to the Hospital Secretary.

HEMEL HEMPSTEAD, HERTFORDSHIRE. WEST HERTS HOSPITAL. CASUALTY OFFICER (Junior Hospital Medical Officer) required. Post vacant now.

Applications, stating 2 names for reference, should be sent to the Hospital Secretary.

HERTFORD COUNTY HOSPITAL. (171 Beds. Hospital situated 21 miles from London.) Applications are invited for appointment of HOUSE SURGEON (general, gynæcology, and obstetrics—first or second post). Recognised under F.R.C.S. regulations, pre-registration post. Duties to commence 23rd July, 1955.

Applications to Group Secretary, Hertford Hospital Management Committee, County Hospital, Hertford, Herts.

HERTFORD COUNTY HOSPITAL. (171 Beds. Hospital situated 21 miles from London.) Applications are invited for the appointment of HOUSE SURGEON (general—first, second, or third post), to commence 6th July, 1955, or as soon as possible. Pre-registration post; recognised under F.R.C.S. regulations.

Applications to Group Secretary, Hertford Group Hospital Management Committee, Hertford County Hospital, Hertford, Herts.

HERTFORD COUNTY HOSPITAL. (171 Beds. Hospital situated 21 miles from London.) Applications are invited for appointment of RESIDENT HOUSE PHYSICIAN (Male or Female), second post held. Recognised pre-registration post. 6 months appointment. Preference given to applicants who have held resident surgical or medical posts in general hospital. Duties to commence 4th July, 1955, or as soon as possible.

Applications to Group Secretary, Hertford Hospital Management Committee, County Hospital, Hertford, Herts.

HILLINGDON HOSPITAL, near Uxbridge, Middlesex. (General—705 Beds.) HOUSE SURGEON (resident) required for gynæcological duties. Previous gynæcological experience desirable, but not essential. Post recognised for M.R.C.O.G. and vacant beginning August.

Apply, stating age, nationality, qualifications, experience and enclosing copies of not more than 3 testimonials, to Medical Director by 11th July.

HILLINGDON HOSPITAL, near Uxbridge, Middlesex. (General—705 Beds.) HOUSE SURGEON (resident) required for obstetric duties. Previous obstetric experience desirable, but not essential. Post recognised for D.Obst.R.C.O.G. and M.R.C.O.G. and vacant end July.

Apply, stating age, nationality, qualifications, experience and enclosing copies of not more than 3 recent testimonials, to Medical Director by 11th July.

HITCHIN HOSPITALS, Hitchin, Hertfordshire. Resident CASUALTY HOUSE OFFICER for duty with the Accident Service and as Orthopædic House Surgeon required for 6 months in the first instance on 1st July, 1955. Recognised as pre-registration post.

Applications, stating age, nationality, qualifications and experience, together with copies of 3 recent testimonials, to be sent immediately to the Medical Administrator, Lister Hospital, Hitchin, Herts.

AMENDED ADVERTISEMENT

HORNCHURCH. ST. GEORGE'S HOSPITAL. Neurosis UNIT. (20 Beds.) REGISTRAR in Psychiatry required July–December, 1955, for work with psychoneurotic and psychosomatic inpatients. Some general psychiatric experience necessary with an interest in psychotherapy. Accommodation available for a Female candidate: or hospital accessible daily from London.

Applications, with names of 2 referees, to the Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford, from whom further information can be obtained.

HUDDERSFIELD ROYAL INFIRMARY. (312 Beds.) HUDDERSFIELD HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON required to commence duty immediately. The post is recognised as a pre-registration appointment and for the F.R.C.S. Salary in accordance with national scale.

Applications, together with copies of 3 recent testimonials, to be addressed to the undersigned as soon as possible.

H. J. JOHNSON, Secretary to the Management Committee.
The Royal Infirmary, Huddersfield.

HULL. KINGSTON GENERAL HOSPITAL. (426 Beds.) HULL A GROUP HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE SURGEON (recognised for the F.R.C.S. examinations). There are 69 general surgical beds and some supervision is required of 17 gynæcological beds. Salary £745, less emoluments. Post vacant 1st August, 1955.

Applications, giving full details, and copies of 2 recent testimonials, to the Hospital Secretary.

HULL. VICTORIA HOSPITAL FOR SICK CHILDREN, Park-street. HULL A GROUP HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON required on 4th August, 1955. Pre-registration or registration post. 6-monthly term, recognised for D.C.H. qualification. Salary according to national scale.

Send replies, with testimonials, to the Hospital Secretary.

KIDDERMINSTER AND DISTRICT GENERAL HOS-PITAL. (112 Beds.) HOUSE SURGEON (not pre-registration) required at the above Hospital. Post vacant.

Applications, with the names of 3 referees, to the Hospital Secretary.

ISLEWORTH. WEST MIDDLESEX HOSPITAL. South WEST MIDDLESEX HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (Orthopædic Unit). Post recognised for F.R.C.S. Candidates should have held medical and general surgical posts and preference will be given to those who have also had orthopædic experience.

Applications, stating age, experience, and qualifications, enclosing up to 3 testimonials, to Group Secretary, West Middlesex Hospital, Isleworth, by 12th July, 1955.

ISLEWORTH. WEST MIDDLESEX HOSPITAL. South WEST MIDDLESEX HOSPITAL MANAGEMENT COMMITTEE. Pre-registration HOUSE PHYSICIAN required on General Medical Unit (70 Beds) and large outpatient clinics. Post vacant 10th August, 1955.

Applications, stating age, nationality, qualifications obtained, with copies of up to 2 recent testimonials, to Group Secretary, West Middlesex Hospital, Isleworth, by 19th July, 1955.

ISLEWORTH. WEST MIDDLESEX HOSPITAL. South WEST MIDDLESEX HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON to General Surgical Unit (approximately 82 Beds) and large outpatient clinics. Post vacant 9th August, 1955.

Applications, stating age, nationality, qualifications and experience, with copies of up to 3 recent testimonials, to Group Secretary, West Middlesex Hospital, Isleworth, by 19th July, 1955.

ISLE OF THANET HOSPITAL MANAGEMENT COMMITTEE.

General Hospital, Ramsgate (101 Beds)
HOUSE SURGEON.
General Hospital, Margate (132 Beds)
HOUSE SURGEON.

Approved pre-registration posts. Salary at the rate of £425–£525 p.a., according to experience, less £125 for residential emoluments.

Applications, with copies of testimonials, to Hospital Secretary of appropriate hospital.

LEAMINGTON SPA. WARNEFORD GENERAL HOSPITAL. (207 Beds.) CASUALTY OFFICER (Senior House Officer). Male or Female, resident or non-resident. Post vacant and suitable for one reading for higher qualifications, being recognised for F.R.C.S., affording contact with all Specialist Units in the Hospital.

Applications, together with 3 references, to Hospital Secretary.

LEICESTER (near). CARLTON HAYES MENTAL HOSPITAL, NARBOROUGH, LEICESTER. LEICESTER NO. 4 HOSPITAL MANAGEMENT COMMITTEE. JUNIOR HOSPITAL MEDICAL OFFICER (psychiatry) required for above Hospital (recognised for training for D.P.M.). Residential accommodation for single person (house may become available for married man).

Apply, giving age, qualifications, experience, and names of 3 referees, to Medical Superintendent immediately.

LEICESTER ROYAL INFIRMARY. Applications are invited for the post of HOUSE SURGEON vacant now. Recognised pre-registration post and for F.R.C.S.

Applications, stating age and qualifications with copies of testimonials, to Group Secretary, No. 1 Hospital Management Committee, The Leicester Royal Infirmary, Leicester, forthwith.

LENNOXTOWN, STIRLINGSHIRE. LENNOX CASTLE MATERNITY HOSPITAL. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER at above Hospital. Salary in accordance with recognised scale and appointment subject to National Health Service (Superannuation) Regulations, 1950.

Applications, stating age, sex, nationality, qualifications, experience and present appointment, together with names and addresses of 3 referees, to be submitted immediately to, The Secretary, Board of Management, Lennox Castle, 113, Douglas-street, Glasgow, C.2.

LEEDS REGIONAL HOSPITAL BOARD. Senior Registrar vacancies.

Psychiatry

(*a*) 5 sessions as Trainee Specialist in Child Psychiatry at the University Department of Psychiatry at the General Infirmary at Leeds and the remainder of the time in mental deficiency at the Westwood Hospital, Bradford, and associated colonies. Accommodation available for a single person. May be non-resident, in which case the person appointed should reside in Bradford. Candidates must hold the D.P.M. or equivalent qualification

(*b*) Stanley Royd Hospital, Wakefield (2000 Beds), and associated clinics. Accommodation for a single person is available. It is anticipated that the successful candidate will undertake 2 clinical sessions (which may include research) in association with the Department of Psychiatry of the University of Leeds. Candidates must hold the D.P.M. or equivalent qualification.

Applications, stating age, qualifications and details of appointments held showing dates, with names and addresses of 3 referees, to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, by 7th July, 1955.

LEEDS REGIONAL HOSPITAL BOARD. Registrar vacancies.

General Surgery

Dewsbury, Batley and Mirfield Group (135 general surgical beds) (resident Dewsbury General Hospital).

Ophthalmology

Duties mainly at hospitals in the Hull A. Hospital Management Committee Group (34 eye beds) (non-resident).

Psychiatry

(*a*) Duties mainly at Bootham Park (202 Beds), near centre of city of York. Accommodation for single person. Post may be resident or non-resident.

(*b*) Menston Hospital, near Leeds (2500 Beds) (resident).

(*c*) Ouiton Hall Hospital, near Wakefield, and affiliated Mental Deficiency Colonies (aggregating 780 Beds) (non-resident).

(*d*) De la Pole Hospital, Willerby, and associated clinics. Resident or non-resident.

If desired facilities for attendance at the Leeds University will be provided if the successful candidates are studying for the D.P.M.

Applications, stating age, qualifications and details of present and previous appointments with dates, together with the names and addresses of 3 referees, to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, by 7th July, 1955.

LEEDS REGIONAL HOSPITAL BOARD. Medical Act, 1950. RESIDENT HOUSE OFFICER posts. Recognised pre-registration house posts will be available for the 6 months commencing 1st August, 1955, in the following hospitals approved under the Medical Act, 1950. Certain posts marked * are vacant now, and applications will be accepted immediately.

Scarborough Hospital (191 Beds)
1 Surgical (general surgery, E.N.T., and orthopædic).
1 Surgical (midwifery and ophthalmology).
City Hospital, York (265 Beds)
1 General Surgical (recognised for F.R.C.S.).
County Hospital, York (222 Beds)
1 General Surgical (recognised for F.R.C.S.).
Hull Royal Infirmary and Sutton (250 Beds)
1 General Surgical (recognised for F.R.C.S.).
1 Surgical (orthopædic).
Western General Hospital, Hull (543 Beds)
1 Medical.
1 Surgical (general surgery and radiotherapy).
1 Surgical (gynæcology).
Kingston General Hospital, Hull (398 Beds)
1 Medical.
1 General Surgical.
Westwood Hospital, Beverley (202 Beds)
1 General Surgical.
1 Surgical (orthopædic).
Recognised for F.R.C.S.
East Riding Hospital, Driffield (249 Beds)
1 Medical (general medical and pædiatric).
1 Surgical (general surgery, gynæcology, and E.N.T.). Recognised for F.R.C.S.
Pontefract General Infirmary (89 Beds)
1 Medical (general medical and pædiatric).
1 General Surgical (recognised for F.R.C.S.).
Clayton Hospital, Wakefield (200 Beds)
1 Surgical (general surgery and gynæcology). Recognised for F.R.C.S.
General Hospital, Wakefield (158 Beds)
1 Medical (general medical and geriatrics).
Seacroft Hospital, Leeds (60 Child Surgery Beds)
1 Surgical (child general surgery, E.N.T., and ophthalmology).
Pinderfields Hospital, Wakefield (663 Beds)
1 Surgical (orthopædic).
1 Surgical (thoracic).
General Hospital, Batley (102 Beds)
1 Surgical (general surgery and E.N.T.).*
1 Surgical (orthopædic and ophthalmology).*
Stainciffe General, Dewsbury (311 Beds)
1 Medical (general medical and dermatology).
1 Medical (general medical and pædiatric).
Huddersfield Royal Infirmary (304 Beds)
1 Medical (general medical and pædiatric).
1 Surgical (general surgery and orthopædic). Recognised for F.R.C.S.
Royal Halifax Infirmary (301 Beds)
1 General Surgical * (recognised for F.R.C.S.).
Halifax General Hospital (425 Beds)
1 Medical (pædiatric).*
2 General Surgical (recognised for F.R.C.S.).
Bradford Royal Infirmary (507 Beds)
1 Medical.
1 General Surgical.
2 Surgical (casualty and orthopædic).*
Recognised for F.R.C.S.
St. Luke's Hospital, Bradford (828 Beds)
2 Medical.
1 Medical (general medical and dermatology).
1 General Surgical.
1 Surgical (general surgery and plastic).*
2 Surgical (orthopædic and casualty).*
All surgical posts recognised for F.R.C.S.
Keighley Victoria Hospital (144 Beds)
1 Surgical (general surgery, orthopædic, and E.N.T.). Recognised for F.R.C.S.
General Hospital, Otley (170 Beds)
1 Surgical (general surgery and orthopædics).
St. James's Hospital, Leeds (1538 Beds)
1 Surgical (gynæcology). Recognised by R.C.O.G.
Harrogate General Hospital (249 Beds)
2 Medical.
1 Surgical (recognised for F.R.C.S.).

Candidates should express, where applicable, their preference for medical, surgical or midwifery posts within the same hospital on the application form.

Candidates wishing to apply for posts at more than 1 hospital should complete a separate form in respect of each hospital.

Application forms can be obtained from the Senior Administrative Medical Officer, Leeds Regional Hospital Board, Park-parade, Harrogate, or from the Dean, School of Medicine, Thoresby-place, Leeds, 2, and should be returned to either of the above-named as soon as possible. Application may be made in advance of results of final examination.

LEEDS REGIONAL HOSPITAL BOARD. Short-term LOCUM TENENS appointments in the Registrar grade are constantly available at hospitals in the area of the Board, particularly in the specialties of anæsthetics, general medicine, general and orthopædic surgery, and psychiatry.

Interested practitioners, suitably experienced, should communicate with the Secretary, Joint Registrars Committee, Park-parade, Harrogate.

LEEDS. THE UNITED LEEDS HOSPITALS. The GENERAL INFIRMARY AT LEEDS. SENIOR REGISTRAR in General Surgery required for a period of 1 year in the first instance from mid-September. Terms and conditions of service for hospital medical staff apply.

Applications, stating age, qualifications, previous posts with dates, and 3 names for reference, should be sent to the Sub-Dean, School of Medicine, Leeds, 2.

LEEDS. THE UNITED LEEDS HOSPITALS. Applications are invited for the post of SENIOR HOUSE OFFICER in the Radiotherapy Centre of the General Infirmary at Leeds. The post is resident and will be for a period of 1 year. The post affords excellent opportunity for training in this specialty. Applications, stating age, qualifications, and previous experience, with the names of 3 referees, should be forwarded to—

J. ARNOLD TUNSTALL, Secretary to the Board.

The General Infirmary, Leeds, 1.

LEEDS. UNITED LEEDS HOSPITALS/LEEDS REGIONAL HOSPITAL BOARD. REGISTRARS in Thoracic Surgery (2 similar appointments). The first year will normally be at the Regional Thoracic Centre, Pinderfields General Hospital, Wakefield (56 Beds), which is under the charge of the Consultants to the Teaching Hospital, and the second year at the General Infirmary at Leeds. Successful candidates will be required to be resident whilst at Pinderfields Hospital. Married quarters available.

Applications, stating age, qualifications and details of present and previous appointments with dates, together with the names and addresses of 3 referees, to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, by 7th July, 1955.

LEEDS A GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the appointment of SENIOR HOUSE OFFICER (anæsthetics) for duties mainly at St. James's Hospital. The appointment, which is recognised for the D.A. and the F.F.A.R.C.S., will be for a period of 1 year, and the salary will be in accordance with the agreed terms and conditions of service of hospital medical and dental staffs—namely, £745 p.a., with an appropriate deduction in respect of board, lodging, and other services provided.

Applications, stating age, qualifications, experience, &c., together with the names of 2 referees, to be forwarded to the undersigned as soon as possible.

J. FOLKARD, Secretary to the Committee.

Administrative Offices, St. James's Hospital, Leeds, 9.

LEEDS, 9. ST. JAMES'S HOSPITAL. Leeds A Group HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners (Male and Female) for the appointment of SENIOR HOUSE OFFICER (orthopædics). The appointment, which is recognised by the Royal College of Surgeons for Fellowship, will be for a period of 1 year and the salary will be in accordance with the agreed terms and conditions of service of hospital medical and dental staffs, namely, £745 p.a. with an appropriate deduction in respect of board, lodgings, and other services provided.

Applications, stating age, qualifications, experience, &c., together with the names of 2 referees, to be forwarded to the undersigned as soon as possible.

J. FOLKARD, Secretary to the Committee.

Administrative Offices, St. James's Hospital, Leeds, 9.

LINCOLN COUNTY HOSPITAL. (200 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER in Surgery and E.N.T., vacant 1st August, 1955. The post is recognised for D.L.O.

Applications, together with names for reference, should be forwarded to R. W. HOWICK, Group Secretary.

LIVERPOOL, 15. SEFTON GENERAL HOSPITAL. (995 Beds, 116 Cots.) Applications are invited for the following resident appointments which will become vacant at the above-named Hospital on 1st September, 1955, and will be for a period of 6 months. These posts are approved as pre-registration posts.

6 HOUSE PHYSICIANS (general).
2 HOUSE PHYSICIANS (psychiatric).
2 HOUSE SURGEONS (general).
2 HOUSE SURGEONS (obstetric).
1 HOUSE PHYSICIAN (tropical).

The terms and conditions of service will be in accordance with the regulations of the Ministry of Health.

Application forms may be obtained from the undersigned to whom they should be returned not later than Thursday, 7th July, 1955.

GARNET CHAPLIN, Secretary to the Committee,
South Liverpool Hospital Management Committee.

AMENDED ADVERTISEMENT

LIVERPOOL. THE UNITED LIVERPOOL HOSPITALS. Applications are invited for 2 posts of REGISTRAR in Pædiatrics for the period 1st October, 1955–30th September, 1956. Annual reappointment until completion of the normal period of training will be considered without the need for further application. The duties of the posts will in the first instance be as follows :—

1 at the Liverpool Maternity Hospital.
1 at the Heswall Branch of the Royal Liverpool Children's Hospital with the status of Resident Medical Officer.

Apply by 9th July, 1955, on form obtainable from the Secretary, 80, Rodney-street, Liverpool, 1.

LUTON AND DUNSTABLE HOSPITAL, CHILDREN'S ANNEXE, LUTON BEDS. RESIDENT PÆDIATRIC HOUSE OFFICER required 1st August, 1955. The post is recognised for the D.C.H., and as a second pre-registration post in medicine. The duties will cover both medical and surgical wards.

Applications, stating age, nationality, qualifications and experience, together with copies of 3 recent testimonials, to be sent as soon as possible to the Secretary, Luton and Hitchin Group Hospital Management Committee, St. Mary's Hospital, Luton, Beds.

MAIDSTONE. WEST KENT GENERAL HOSPITAL. (141 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the pre-registration post of HOUSE SURGEON. 6 months appointment. Salary at the rate of £425, £475–£525 according to experience. A deduction at the rate of £125 a year is made in respect of board and lodging and other services provided.

Applications should be forwarded as soon as possible to the Administrative Officer at the Hospital.

LOUTH. COUNTY INFIRMARY. (245 Beds.) Grimsby HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post, now vacant, of SENIOR HOUSE OFFICER (orthopædic and casualty).

Applications, stating age and experience, together with names of 2 referees, to the Hospital Secretary.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for the post of REGISTRAR in Chest Diseases to the Wigan and Leigh and Wrightington Groups of hospitals. 2 busy chest clinics and opportunity to gain experience in Thoracic Surgical Unit.

Applications, together with the names of 2 referees, to the Secretary, Wigan and Leigh Hospital Management Committee, Knowsley House, Wigan, to be received not later than 14th July, 1955.

MANCHESTER REGIONAL HOSPITAL BOARD. REGISTRAR in General Medicine to the Bolton and District Group of hospitals, with main duties at Bolton District General Hospital and Bolton Royal Infirmary. Vacant 1st September.

Applications, stating age, nationality, qualifications, experience, and the names of 2 referees, should be sent immediately to Group Secretary, Bolton and District Hospital Management Committee, The Royal Infirmary, Bolton.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for the post of REGISTRAR in Orthopædic Surgery, to the Blackpool and Fylde Group of Hospitals, with main duties at Victoria Hospital, Blackpool.

Applications, together with names and addresses of 2 referees, should be sent to the Group Secretary, Blackpool and Fylde Hospital Management Committee, Victoria Hospital, Blackpool.

MANCHESTER REGIONAL HOSPITAL BOARD. North AND MID CHESHIRE HOSPITAL MANAGEMENT COMMITTEE. ST. ANNE'S E.N.T. HOSPITAL, BOWDON, CHESHIRE. (53 Beds.) REGISTRAR required (preferably resident) for post now vacant.

Applications to be forwarded with 2 recent testimonials, to the Group Secretary, The Hospital, Sinderland-road, Altrincham, Cheshire.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for the post of REGISTRAR in General Surgery to the Blackpool and Fylde Group of hospitals, with main duties at Victoria Hospital, Blackpool (348 Beds). The post which is vacant on 1st August, 1955, is recognised under the F.R.C.S. regulations. The appointment offers an excellent opportunity of gaining practical experience in general and emergency surgery to suitably qualified candidates.

Applications, stating age, qualifications and experience, together with the names of 3 referees, should be sent to the Group Secretary, Blackpool and Fylde Hospital Management Committee, Victoria Hospital, Blackpool.

MANCHESTER REGIONAL HOSPITAL BOARD invites applications for the post of RESIDENT REGISTRAR in Obstetrics and Gynæcology. The duties will be with the Stockport and Buxton Hospital Management Committee, mainly at Stepping Hill Hospital and Stockport Infirmary, where there are 68 obstetric and 48 gynæcological beds. The post is recognised for M.R.C.O.G. and is vacant 1st October, 1955.

Applications, stating age, experience and qualifications, together with the names of 2 referees, to be forwarded to—

H. G. PRICE, Group Secretary.

59B, Shaw-heath, Stockport, Cheshire.

MANCHESTER REGIONAL HOSPITAL BOARD. SENIOR REGISTRAR in Psychiatry. The person appointed will be required to attend Consultant Psychiatric Clinics and take part in the treatment of inpatients and outpatients at hospitals in the Bolton area in association with the Consultant Psychiatrist. Arrangements may later be made for the successful candidate to undertake a period of duty at Prestwich Mental Hospital, near Manchester.

Application forms obtainable from the Senior Administrative Medical Officer of the Board, Cheetwood-road, Manchester, 8, should be returned by 11th July, 1955.

MANCHESTER REGIONAL HOSPITAL BOARD invites applications for the post of MEDICAL REGISTRAR in the Rehabilitation Unit and Department of Physical Medicine at the Devonshire Royal Hospital, Buxton, vacant 1st October, 1955. The post offers excellent opportunity in research and the Hospital is recognised for the Diploma in Physical Medicine. A self-contained, unfurnished flat is available at a rental.

Applications, stating age, experience and qualifications, together with the names of 2 referees, to be forwarded to the undersigned within 10 days of the appearance of this advertisement. H. G. PRICE, Group Secretary.

59B, Shaw-heath, Stockport, Cheshire.

MANCHESTER, 20. WITHINGTON HOSPITAL. South MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER to the Geriatric Department which will become vacant in August (resident or non-resident). Duties are primarily in the active medical wards. Excellent experience is available in the unit which has been developed on modern lines and has available full general hospital facilities.

Applications, stating age, qualifications, present post, experience and the names of 2 referees, to be forwarded to the Group Secretary at the Hospital immediately.

MANCHESTER. UNITED MANCHESTER HOSPITALS. MANCHESTER ROYAL INFIRMARY, MANCHESTER, 13. RESIDENT MEDICAL OFFICER (Registrar grade) to commence as soon as possible. Whole-time resident appointment for 12 months, renewable. Applicants should have held house appointments and have had medical experience. Preference will be given to candidates holding higher qualifications. Residence charge £155 p.a.

Applications to be made on forms obtainable from the undersigned and to be returned not later than 20th July, 1955.

G. H. TAYLOR, Secretary.

MANCHESTER. UNITED MANCHESTER HOSPITALS. MANCHESTER ROYAL INFIRMARY, MANCHESTER, 13. 2 REGISTRARS to the Department of Diagnostic Radiology, to commence as soon as possible. Whole-time non-resident appointments for 12 months, renewable. Applicants must possess the D.M.R.D. or its equivalent.

Application to be made on form obtainable from the undersigned and to be returned not later than 13th July, 1955.

G. H. TAYLOR, Secretary.

MANCHESTER. WEST MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. PARK HOSPITAL, DAVYHULME. (General Hospital—433 Beds.) 1 SENIOR HOUSE OFFICER (non-tuberculous thoracic surgery) required for Manchester Regional Hospital Board Centre. Post now vacant.

Forms from Secretary.

MANCHESTER. WEST MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. PARK HOSPITAL, DAVYHULME. (General Hospital—433 Beds.) SENIOR HOUSE OFFICER (anæsthetics) required. Post now vacant. Hospital recognised for training for Diploma in Anæsthetics.

Forms from Secretary.

MANCHESTER, 9. SOOTH HALL CHILDREN'S HOSPITAL. (380 Beds.) RESIDENT SENIOR HOUSE OFFICER (surgical). Post vacant now. Duties will be mainly general surgery.

Applications, with usual particulars and copies of 2 recent testimonials, to the Medical Superintendent as soon as possible.

MANCHESTER, 19. DUCHESS OF YORK HOSPITAL FOR BABIES. SOUTH MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for registered practitioners for the post of SENIOR HOUSE OFFICER (pædiatrics) at the above Hospital. The post is resident and will be vacant on 3rd October, 1955. The Hospital is associated with the Manchester University for teaching purposes.

Applications, stating age, qualifications, present post, experience and names of 2 referees, to be forwarded to the Group Secretary, Withington Hospital, Manchester, 20, within 7 days of the appearance of this advertisement.

MACCLESFIELD HOSPITAL. West Park Branch. MACCLESFIELD AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications invited for SENIOR HOUSE OFFICER (pædiatrics). Department is a busy one of 35 Beds and 30 neonatal cots, and is recognised for purposes of Diploma in Child Health and provides invaluable experience.

Apply immediately Group Secretary, "Willerby House," Cumberland-street, Macclesfield.

MACCLESFIELD. PARKSIDE MENTAL HOSPITAL. (1647 Beds.) Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER (psychiatric). Accommodation available for a married or a single person. The appointment in the first place will be for a period of 4 years but reapplication may be made by the successful applicant at the end of this period. Facilities for attending the course for the D.P.M. at Manchester University will be granted and the Hospital is recognised by the Conjoint Board for the purpose of the D.P.M.

Applications, with the names of 3 referees, to be sent to the Medical Superintendent by 14th July, 1955.

NEWCASTLE GENERAL HOSPITAL. (838 Beds.) NEWCASTLE UPON TYNE HOSPITAL MANAGEMENT COMMITTEE. The resident post of SENIOR HOUSE OFFICER (general surgery), tenable for 12 months, becomes vacant on 1st July, 1955.

Applications, with 1 copy of 2 testimonials, should be sent to the Secretary, Newcastle General Hospital, Westgate-road, Newcastle upon Tyne, 4, as soon as possible.

NEWCASTLE REGIONAL HOSPITAL BOARD. North WEST DURHAM HOSPITAL MANAGEMENT COMMITTEE. REGISTRAR SURGEON (whole-time), resident, or non-resident close to Shotley Bridge Hospital (557 Beds).

Applications, with names and addresses of 3 referees, to Senior Administrative Medical Officer, "Blythswood South," Osborne-road, Newcastle upon Tyne, 2, within 14 days.

NEWCASTLE REGIONAL HOSPITAL BOARD. Special AREA FOR CUMBERLAND AND NORTH WESTMORLAND. EAST CUMBERLAND GROUP OF HOSPITALS. SURGICAL REGISTRAR (resident) for 1 year in the first instance, with likelihood of extension. Main duties at Cumberland Infirmary, Carlisle (340 Beds). The post is recognised under the F.R.C.S. regulations.

Applications, with names and addresses of 3 referees, to the Senior Administrative Medical Officer, 72, Warwick-road, Carlisle, within 14 days.

NEWCASTLE. THE UNITED NEWCASTLE UPON TYNE HOSPITALS. Applications are invited for the resident appointment of SENIOR HOUSE OFFICER to the Department of Obstetrics and Gynæcology. The appointment is for 1 year and will be subject to the terms and conditions of service of hospital medical staff. The salary will be at the rate of £745 p.a., subject to the appropriate deductions.

Applications, giving full details and the names and addresses of 3 referees, should be sent to the undersigned within 2 weeks of the appearance of this advertisement.

A. W. SANDERSON, House Governor and Secretary.

Royal Victoria Infirmary, Newcastle upon Tyne.

NEWCASTLE UPON TYNE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the 2 SENIOR HOUSE OFFICER posts (preferably resident) at the Newcastle Eye Hospital (31 Beds) and the Eye Unit at Walker Clinical Annexe (21 Beds). The Hospital is recognised for the Diploma of Ophthalmology. Previous experience in ophthalmology will be an advantage. Salary in accordance with the terms and conditions of service of hospital medical and dental staffs.

Applications, with the names of 3 referees, should be sent to the Hospital Secretary, Eye Hospital, St. Mary's-place, Newcastle upon Tyne, as soon as possible.

NEWMARKET GENERAL HOSPITAL, Newmarket, SUFFOLK. SENIOR HOUSE SURGEON (Senior House Officer grade). Tenable for 6 months in first instance. Duties mainly surgical, but a small amount of E.N.T. and ophthalmic surgery is included. Preference to candidates who wish to be trained in surgical technique and to gain experience in operative surgery.

Applications, with copies of 3 testimonials, to Physician-Superintendent.

NEWMARKET GENERAL HOSPITAL, Newmarket. Applications are invited for the post of HOUSE PHYSICIAN, vacant 29th July, 1955. Duties include house charge of general medical and pulmonary tuberculosis beds. The post is recognised for pre-registration, is resident and tenable for 6 months. Salary in accordance with national scale.

Applications, together with 3 recent testimonials, to Physician-Superintendent.

NEWMARKET GENERAL HOSPITAL, Newmarket. Applications are invited for the post of HOUSE SURGEON vacant 9th July, 1955. Duties include surgical house charge of general surgical, E.N.T., and eye cases. Post resident and available for 6 months, recognised for pre-registration.

Applications, with copies of 3 testimonials, to the Physician-Superintendent.

NOTTINGHAM AND MIDLAND EYE INFIRMARY. Required, 2 SENIOR HOUSE OFFICERS, duties to commence immediately and 31st July. Salary and conditions of service in accordance with Ministry regulations.

Applications, stating age, qualifications and experience, together with copies of testimonials, to be sent to the Group Secretary, General Hospital, Nottingham.

NOTTINGHAM AND MIDLAND EYE INFIRMARY. (Recognised Training Hospital for D.O.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time REGISTRAR (ophthalmology) required. Furnished flat available for married candidates. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 11th July, 1955 giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

NOTTINGHAM. CITY HOSPITAL. (804 Beds.) Applications are invited for the post of RESIDENT ANÆSTHETIST (Senior House Officer), vacant early July. The post is recognised for the D.A. and the F.F.A.R.C.S. and offers wide experience; this is a busy general hospital with Departments in General, Orthopædic, Gynæcological, Thoracic, and Plastic Surgery.

Applications, stating age, nationality and qualifications, together with copies of not more than 3 testimonials, to be sent to the Hospital Secretary, City Hospital, Hucknall-road, Nottingham.

NOTTINGHAM. CITY HOSPITAL. (734 Beds. Recognised for D.Path.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT or NON-RESIDENT REGISTRAR (pathology) required. Post includes duties at other hospitals in the Nottingham Group. Appointment for 1 year in the first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 11th July, 1955, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

NOTTINGHAM. CITY HOSPITAL. (804 Beds.) Applications are invited for 2 posts of HOUSE PHYSICIAN, vacant 19th August and 1st September, respectively. Recognised for pre-registration purposes.

Applications, stating age, nationality, qualifications, and experience, together with copies of not more than 3 testimonials, to be sent immediately to the Hospital Secretary, City Hospital, Hucknall-road, Nottingham.

NOTTINGHAM GENERAL HOSPITAL. Hogarth Radiotherapy Centre. A vacancy exists at the above Centre for a SENIOR HOUSE OFFICER in Radiotherapy or REGISTRAR (if in possession of Part I, D.M.R.T.) in Radiotherapy. The Centre is recognised as a Training School for both Part I and II D.M.R.T. (Royal Colleges of London) in conjunction with the University of Nottingham, and instruction for this examination can be given to those interested and suitable. The position offers excellent experience for persons studying for other post-graduate degrees.

Apply as soon as possible, stating age, qualifications and experience, together with names of 3 referees, to the Group Secretary, General Hospital, Nottingham.

NOTTINGHAM GENERAL HOSPITAL. Applications are invited for the post of RESIDENT SENIOR ANÆSTHETIC HOUSE OFFICER, vacant now. The post is recognised for the D.A. and the F.F.A. R.C.S. This is a busy general hospital, giving experience in all branches of surgery.

Applications, stating age, nationality and qualifications, together with copies of testimonials, to be sent to the Group Secretary.

NOTTINGHAM GENERAL HOSPITAL. E.N.T. Department. Applications are invited for the post of SENIOR E.N.T. HOUSE OFFICER for the above Hospital. This appointment is recognised for the D.L.O. and the F.R.C.S. examinations. Salary and conditions of service in accordance with Ministry regulations. Duties to commence as soon as possible. Although the post is normally resident, consideration will be given to any applicant who desires to live out.

Applications, stating age, qualifications and experience, together with copies of testimonials, to be sent to the Group Secretary, General Hospital, Nottingham.

OXFORD REGIONAL HOSPITAL BOARD. Whole-time REGISTRAR in Obstetrics and Gynæcology to the hospitals of the Swindon area. The appointment will be for 1 year and eligible for extension to 2 years.

Forms, obtainable from the Secretary, Registrar Committee, 43, Banbury-road, Oxford, must reach him by 23rd July.

OXFORD REGIONAL HOSPITAL BOARD. Senior REGISTRAR to the Department of Medicine, Reading Group of hospitals. Appointment for 1 year in the first instance, eligible for extension up to 4 years. A higher medical qualification is desirable. Candidates are invited to visit the hospitals by arrangement with the Group Secretary.

Applications on forms obtainable from the Secretary, Joint Committee for Senior Registrars, 43, Banbury-road, Oxford, to reach him by 23rd July.

OXFORD REGIONAL HOSPITAL BOARD. Senior REGISTRAR in General Surgery to the hospitals of the Reading area for 1 year in the first instance, eligible for extension to 4 years subject to satisfactory annual review. Single accommodation in hospital is available if required. The hospitals may be visited by arrangement with the Group Secretary, 3, Craven-road, Reading.

Applications on forms obtainable from the Secretary, Registrar Committee, 43, Banbury-road, Oxford, must reach him by 16th July, 1955.

OXFORD. THE UNITED OXFORD HOSPITALS. Applications are invited for the post of RESIDENT MEDICAL OFFICER to The Slade Hospital, Oxford, to commence on 1st August. The post is mainly concerned with infectious diseases (36 Beds) and with early cases of chest disease. (14 Beds.) There will also be occasional responsibility for dermatological and venereal disease cases, and there is an excellent opportunity for study. Salary at the Junior Hospital Medical Officer scale (£775–£1075).

Applications, with full particulars of qualifications and experience and the names of 2 referees, to be sent to the Administrator, Radcliffe Infirmary, Oxford, to arrive not later than 15th July, 1955.

NORWICH. NORFOLK AND NORWICH HOSPITAL. Applications are invited for the following appointments vacant 1st August, 1955. All are pre-registration posts and the salaries in each case are at the rate of £425, £475, or £525 p.a. according to experience, less £125 p.a. for residential emoluments :—

(1) **Norfolk and Norwich Hospital, Norwich**

HOUSE PHYSICIAN (Male or Female). Duties entirely general medical.

HOUSE SURGEON (Male or Female). Post recognised for Final F.R.C.S. examination requirements. Duties entirely general surgical.

JUNIOR CASUALTY OFFICER (2 Casualty Officers employed in Department).

(2) **Jenny Lind Hospital for Children, Norwich**

RESIDENT MEDICAL OFFICER (Male or Female).

HOUSE SURGEON (Male or Female).

At the Jenny Lind Hospital which forms the entire Pædiatric Department of the United Norwich Hospitals. The duties are under the direct supervision of the Consultant staff of the Norfolk and Norwich Hospital.

(3) **West Norwich and Norwich Isolation Hospitals**

HOUSE PHYSICIAN (Male or Female). Duties include acute medical, geriatric and infectious diseases. The beds at these units are under the control of the Consultant Physicians at the Norfolk and Norwich Hospital, and the successful candidate will be required to undertake general medical duties under their supervision.

(4) **West Norwich Hospital, Norwich**

HOUSE SURGEON (Male or Female). Post recognised for Final F.R.C.S. examination requirements. Duties general surgical and including burns and plastic work. The beds at this Hospital are under the control of the Consultant staff of the Norfolk and Norwich Hospital.

(5) **Norfolk and Norwich Hospital, Norwich.** Applications are also invited for the following House Officer appointments vacant 1st August, 1955 :—

SENIOR CASUALTY OFFICER AND HOUSE SURGEON to the Septic Block, Male or Female (2 Casualty Officers employed). Recognised for Final F.R.C.S. examination requirements. Salary £745 p.a., less £150 for full residential emoluments.

ORTHOPÆDIC HOUSE SURGEON (House Officer or Senior House Officer status). Salary £745 p.a. if Senior House Officer, less £150 for full residential emoluments.

Applications for the above posts stating age, qualifications and experience (Membership of a Medical Defence Society is a condition of appointment), with names of 2 referees, to be sent to Group Secretary, No. 6 Group Hospital Management Committee, St. Stephen's-road, Norwich.

NORWICH. UNITED NORWICH HOSPITALS. Norfolk AND NORWICH HOSPITAL, NORWICH. Applications are invited for the appointment of SENIOR HOUSE OFFICER ANÆSTHETIST, salary £745 p.a. If residential accommodation required, deduction of £150 p.a. Recognised for D.A. and F.F.A.R.C.S. Membership of a Medical Defence Society is a condition of appointment.

Applications stating age, qualifications and experience, with names for reference, to Secretary (Group 6), Hospital Management Committee, St. Stephen's-road, Norwich.

PETERBOROUGH. THE MEMORIAL HOSPITAL. PETERBOROUGH AND STAMFORD HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the position of HOUSE SURGEON, which will be vacant on 18th July, 1955.

Applications, with testimonials, should be addressed to the Secretary, Memorial Hospital, Peterborough.

PETERBOROUGH. THE MEMORIAL HOSPITAL. PETERBOROUGH AND STAMFORD HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the position of SENIOR HOUSE OFFICER (orthopædic), vacant now. Exceptional experience offered in busy department.

Apply to the Secretary, Memorial Hospital, Peterborough.

PLYMOUTH. SCOTT ISOLATION HOSPITAL. House PHYSICIAN (resident, Male) post vacancy 1st August, 1955. Recognised pre-registration post which offers excellent experience.

Applications should be sent to the Group Secretary, Plymouth Special Hospital Management Committee, 8, Nelson-gardens, Stoke, Plymouth.

PLYMOUTH. SOUTH DEVON AND EAST CORNWALL HOSPITAL.

SENIOR HOUSE OFFICER in Surgery, Greenbank Road Section, vacant 1st August, 1955. Recognised for the F.R.C.S.

SENIOR HOUSE OFFICER in Surgery, Devonport Section, vacant 21st August, 1955. Recognised for the F.R.C.S.

SENIOR HOUSE OFFICER to Casualty and Traumatic Department, Freedom Fields Section, vacant 3rd August, 1955.

HOUSE OFFICER in Obstetrics, Alexandra Maternity Home, vacant immediately.

Applications, stating age, nationality, qualifications and experience, with names of 3 referees, to be sent to—

ARTHUR R. CASH, Group Secretary, Plymouth,
South Devon and East Cornwall General Hospital Group.
7, Nelson-gardens, Stoke, Plymouth.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE.

Royal Portsmouth Hospital

HOUSE OFFICER for pædiatric and medical beds—total 30. Pre-registration post. Vacant 16th July, 1955.

HOUSE SURGEON (70 surgical beds), vacant 1st August. Pre-registration post.

HOUSE PHYSICIAN (65 medical beds), vacant 17th August. Pre-registration post.

St. Mary's Hospital (74 medical and 107 surgical beds)

HOUSE PHYSICIAN, vacant 31st July. Pre-registration post.

HOUSE PHYSICIAN, vacant 5th August. Pre-registration post.

HOUSE PHYSICIAN, vacant 24th August. Pre-registration post.

HOUSE SURGEON, vacant 25th July. Pre-registration post.

HOUSE SURGEON, vacant 26th July. Pre-registration post.

HOUSE SURGEON, vacant 31st July. Pre-registration post.

Queen Alexandra Hospital (126 surgical beds)

HOUSE SURGEON, vacant 2nd August. Pre-registration post.

Applications, stating age, experience and qualifications, together with names of 2 referees, should be forwarded as soon as possible to L. C. ROGERS.

35, Grove-road South, Southsea.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE.

Queen Alexandra Hospital

SENIOR HOUSE OFFICER required for the Gynæcological Department of the Group for duties at the above Hospital. 40 gynæcological beds. Recognised for M.R.C.O.G. Vacant now.

Applications, stating age, experience, and qualifications, together with names of 2 referees, should be forwarded as soon as possible to L. C. ROGERS.

35, Grove-road South, Southsea.

READING. ROYAL BERKSHIRE HOSPITAL. (401 Beds.) Applications are invited from registered medical practitioners only for the resident post of JUNIOR HOUSE SURGEON (gynæcology), vacant immediately and tenable for 6 months.

Write, stating age, qualifications with dates, nationality, present post, with copy of 1 recent testimonial, to the Secretary.

READING. ROYAL BERKSHIRE HOSPITAL. (401 Beds.) Applications are invited from registered medical practitioners for the appointment of SENIOR RESIDENT ANÆSTHETIST, vacant 20th July, for period of 1 year, F.F.A.R.C.S. recognised. Salary £745 p.a., less £125 p.a. board-residence.

Write, stating age, qualifications with dates, nationality and present post, with copy of 1 recent testimonial, to Secretary.

REDHILL. EAST SURREY HOSPITAL, Shrewsbury-road. (139 Beds.) HOUSE SURGEON (Male) required—pre-registration post.

Apply to the Hospital Secretary.

REDHILL. EAST SURREY HOSPITAL, Shrewsbury-road. Locum HOUSE SURGEON required immediately at above Hospital.

Apply to the Hospital Secretary.

REDHILL AND CROYDON GROUP HOSPITAL MANAGEMENT COMMITTEES. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR in Chest Medicine. Assistant to Consultant Chest Physician in Redhill and Purley Chest Clinic areas with combined population of 205,700 and combined register of 1000. The work includes clinic and hospital duties (49 beds) and also preventive work under Local Authority schemes. Applicants may visit Redhill clinic by arrangement with Consultant.

Apply to Group Secretary, Redhill Group Hospital Management Committee, Earlswood Mount, Pendleton-road, Redhill, Surrey.

ROCHDALE AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (medicine), resident, required at Birch Hill Hospital mid-July.

Apply at once to Group Secretary, Central Offices, Birch Hill Hospital, Rochdale, Lancs.

ROCHFORD, ESSEX. GENERAL HOSPITAL. Applications are invited for the post of SENIOR HOUSE OFFICER to the Geriatric and Psychiatric Units at the above Hospital. A wide range of facilities are available at the Hospital for the investigation, treatment and rehabilitation of acute and chronic cases. Furnished or unfurnished accommodation available. Post vacant 1st July, 1955.

Applications stating age, &c., to be sent to the undersigned by 6th July, 1955. J. C. FIELD, Secretary.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) ORTHOPÆDIC HOUSE SURGEON (resident) required in the Orthopædic and Accident Unit from 8th August, 1955. The service consists of 100 Beds equally divided between traumatic surgery and "cold" orthopædics. Post is recognised for pre-registration purposes and for F.R.C.S.

Applications to be sent to Group Secretary, Romford Hospital Management Committee, Oldchurch Hospital, as soon as possible.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) SENIOR HOUSE OFFICER (resident) required from 1st August, 1955, for duties in the Casualty and Admissions Department. This is a large general hospital with specialised departments dealing with all types of acute medical and surgical cases. The post affords good opportunity for gaining tuition and experience.

Applications should be addressed to Group Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford, as soon as possible.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) 3 HOUSE PHYSICIANS (resident) required from 25th July, 23rd and 31st August, 1955. Open to either pre-registration applicants or to fully qualified practitioners. Posts tenable for 6 months.

Apply to Group Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford, as soon as possible.

ROMFORD, ESSEX. RUSH GREEN HOSPITAL. (301 Beds.) RESIDENT SENIOR HOUSE OFFICER in Anæsthetics (Male or Female) required from 20th August, 1955. Married quarters available. Post affords good experience; modern equipment. Recognised for D.A. and F.F.A.R.C.S.

Applications to Medical Superintendent. Hospital may be seen by arrangement (Tel. Romford 7711).

ROMFORD, ESSEX. RUSH GREEN HOSPITAL. (301 Beds.) RESIDENT HOUSE OFFICER (general surgery) required from 14th August, 1955. Post is recognised for pre-registration purposes and for F.R.C.S.

Applications should be forwarded immediately to Medical Superintendent stating also names of 2 referees.

SALFORD, 6, LANCASHIRE. HOPE HOSPITAL. Salford HOSPITAL MANAGEMENT COMMITTEE. Applications invited for post of SURGICAL SENIOR HOUSE OFFICER. Post is recognised for the F.R.C.S. Eng.

Applications, stating age, qualifications, and details of experience, together with names and addresses of 2 referees, to the Hospital Secretary as soon as possible.

SALISBURY GENERAL HOSPITAL. Salisbury Group HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of RESIDENT HOUSE SURGEON/HOUSE PHYSICIAN to run consecutively in this order from 19th August, 1955, for a period of 6 months in each post. The post is open to pre-registration candidates.

Apply, naming 2 referees, to Group Secretary, Odstock Hospital, Salisbury.

SALISBURY GENERAL HOSPITAL. Salisbury Group HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of SENIOR HOUSE OFFICER to the E.N.T. Department. Post is recognised for D.L.O. and F.R.C.S. and is vacant September, 1955.

Applications, naming 2 referees, to Group Secretary, Odstock Hospital, Salisbury, Wilts.

SCOTLAND. EASTERN REGIONAL HOSPITAL BOARD. General Medicine. MARYFIELD HOSPITAL, DUNDEE. Applications are invited for the appointment of REGISTRAR at Maryfield Hospital, Dundee (400 Beds), a general teaching hospital associated with the University of St. Andrews, in the unit under the charge of the Professor of Pharmacology and Therapeutics. Salary and conditions of service in accordance with national agreement.

Forms of application and further particulars from the Secretary to the Board, 430, Blackness-road, Dundee, with whom applications must be lodged not later than 16th July, 1955.

SCOTLAND. EASTERN REGIONAL HOSPITAL BOARD. RADIODIAGNOSIS. DUNDEE TEACHING HOSPITALS. Applications are invited for an appointment as SENIOR REGISTRAR in Radiodiagnosis at Dundee Royal Infirmary (510 Beds) and Maryfield Hospital, Dundee (400 Beds) both general teaching hospitals associated with the University of St. Andrews. Possession of the Diploma in Radiology is essential. A new Radiodiagnostic Department at Dundee Royal Infirmary is expected to be in operation shortly. Salary and conditions of service in accordance with national agreement.

Forms of application and further particulars from the Secretary to the Board, 430, Blackness-road, Dundee, with whom applications must be lodged not later than 16th July, 1955.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. Applications are invited from suitably qualified medical practitioners for the post of SENIOR REGISTRAR in Psychiatry in the Child Guidance Department of the Royal Hospital for Sick Children, Edinburgh.

Applications, giving particulars of age, previous experience, and qualifications, together with the names fo 3 referees, should be submitted to the Secretary, South-Eastern Regional Hospital Board, Scotland, 11, Drumsheugh-gardens, Edinburgh, 3, by 23rd July, 1955.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of SENIOR REGISTRAR in Medicine at the Royal Infirmary of Edinburgh, vacant on 1st October, 1955.

Applications, giving particulars of age, qualifications and previous experience, together with the names of 3 referees, should be submitted to the Secretary, South-Eastern Regional Hospital Board, Scotland, 11, Drumsheugh-gardens, Edinburgh, 3, by 30th July, 1955.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of SENIOR REGISTRAR in E.N.T. Surgery based at the Royal Infirmary, Glasgow, which will be for 1 year in the first instance. This appointment is subject to the National Health Service (Scotland) superannuation regulations.

Applications (12 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, by 25th July, 1955.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of REGISTRAR in Medicine at the Western Infirmary, Glasgow, with duties in Neurology at Killearn Hospital, Stirlingshire, which will be for 1 year in the first instance. This appointment is subject to the National Health Service (Scotland) superannuation regulations.

Applications (12 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, by 25th July, 1955.

SCUNTHORPE AND DISTRICT WAR MEMORIAL HOSPITAL. (267 Beds. Recognised for the F.R.C.S.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT SURGICAL REGISTRAR required. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 11th July, 1955, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

SHEFFIELD REGIONAL HOSPITAL BOARD. Mark-FIELD SANATORIUM. (163 Beds.) Whole-time RESIDENT REGISTRAR (chest diseases) required. Duties will include attendance at chest clinics associated with Sanatorium under supervision of the Consultant. Minor thoracic procedures are carried out and the staff closely associated with the neighbouring major Thoracic Surgical Unit. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 11th July, 1955, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time SENIOR ORTHOPÆDIC REGISTRAR (transitional appointment) required for 1 year in first instance at the Doncaster Royal Infirmary. Applications invited from Senior Orthopædic Registrars in their fourth or subsequent years and from those who held such posts for 3 years or more but vacated them after 1st January, 1951.

Applications, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees, should be sent to the Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, to arrive not later than 18th July, 1955.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time NON-RESIDENT SENIOR REGISTRAR in Anæsthetics required within the Nottingham Group of hospitals with duties mainly at Nottingham City Hospital. A Plastic Surgery Unit has been established at Nottingham City Hospital and experience in this type of work would be an advantage. Appointment for 1 year in first instance, reviewable annually. It has been agreed between the Sheffield Regional Hospital Board and the Board of Governors of the United Sheffield Hospitals that, subject to satisfactory work and progress, the tenure of the appointment will be divided between the Nottingham No. 2 Hospital Management Committee Group of Hospitals and 1 of the Teaching Hospitals.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 18th July, 1955, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS. ROYAL HOSPITAL UNIT. Applications are invited for the non-resident post of SENIOR REGISTRAR in Orthopædics, at the above Hospital. Fellowship of 1 of the Royal Colleges of Surgeons essential.

Applications, stating age, qualifications and experience, with names of 3 referees, should be sent not later than 18th July, 1955, to the Chief Administrative Officer, The United Sheffield Hospitals, West-street, Sheffield, 1.

SHREWSBURY. ROYAL SALOP INFIRMARY, CHIL-DREN'S UNIT, SHREWSBURY HOSPITAL GROUP, SENIOR HOUSE OFFICER or HOUSE OFFICER (paediatric), vacant immediately. The Unit consists of medical, surgical and fever beds.

Applications, with copy testimonials, to Group Secretary, Royal Salop Infirmary, Shrewsbury.

SHREWSBURY. ROYAL SALOP INFIRMARY. (500 Beds.) SHREWSBURY HOSPITAL GROUP. HOUSE SURGEON required immediately. Pre-registration candidates eligible. Recognised for the F.R.C.S.

Applications, with copy testimonials, to Group Secretary, Royal Salop Infirmary, Shrewsbury.

SHREWSBURY HOSPITAL GROUP. Registrar in E.N.T. Surgery. Duties—E.N.T. Hospital, Shrewsbury (68 Beds), and Copthorne Hospital (168 Beds). Resident/non-resident. Considerable experience specialty desirable.

Application forms from Group Secretary, Royal Salop Infirmary, Shrewsbury, to be returned before 16th July, 1955. Candidates may visit hospitals.

SIDCUP AND SWANLEY HOSPITAL MANAGEMENT COMMITTEE. Locum RESIDENT SURGICAL OFFICER required for minimum of 3 weeks from 9th July, 1955, continuing until a permanent appointment is made. Rate of pay £17 10s. per week. Applicants should be widely experienced as a considerable amount of emergency surgery is required.

Applications to Secretary, Queen Mary's Hospital, Sidcup, Kent.

SOUTHPORT GENERAL INFIRMARY. (Recognised for F.R.C.S. and pre-registration.) HOUSE SURGEON (general surgery and ophthalmology). Post vacant late July or early August, 1955.

Apply, stating age, qualifications, experience, nationality, and enclosing 2 copy testimonials, to Group Secretary, Southport and District Hospital Management Committee, Promenade Hospital, Southport.

SOUTHAMPTON EYE HOSPITAL. (32 Beds. Recognised for the D.O. examination.) RESIDENT SENIOR HOUSE OFFICER required immediately.

Applications, with copies of testimonials, should be forwarded as soon as possible to the Secretary, Southampton Group Hospital Management Committee, Bullar-street.

SOUTHAMPTON GENERAL HOSPITAL. (471 Beds.) SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of Whole-time MEDICAL REGISTRAR becoming vacant on 1st October. Post will be tenable for 1 year in the first instance. Candidates may visit the Hospital, if desired, by prior arrangement.

Forms of application, obtainable from the undersigned, should be returned not later than 13th July, 1955.

FRANK JENNINGS, Group Secretary,
Southampton Group Hospital Management Committee.
Bullar-street, Southampton.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL. (278 Beds.) ORTHOPÆDIC HOUSE SURGEON required. Post recognised for Pre-registration Service and tenable for 6 months. This Hospital is the centre to which all trauma from a large industrial town and port is directed, thus providing excellent experience in the treatment of traumatic conditions; patients with orthopædic conditions are also drawn from a wide area.

Applications, with copies of testimonials, should be sent as soon as possible, to the Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SLOUGH, BUCKINGHAMSHIRE. UPTON HOSPITAL. HOUSE OFFICER (casualty) required, 1 of 2, for busy Casualty Department. Experience provided in orthopædic and plastic cases.

Applications, stating age and qualifications, with copies of 2 testimonials, to Hospital Secretary.

ST. HELENS AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. WHISTON HOSPITAL, PRESCOT (892 Beds), ST. HELENS HOSPITAL (196 Beds). Applications are invited for the appointment of CASUALTY OFFICER, in the Senior House Officer grade, at each of the above Hospitals. The posts are approved for the 6 months training in casualty work required of candidates for the Fellowship examination of the Royal College of Surgeons.

Applications, stating age, qualifications, and experience, and giving 2 names for reference, and stating for which Hospital application is made, should be forwarded immediately to—

N. RICHARDS, Secretary.
Group Office, Whiston Hospital, Prescot.

ST. HELENS AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. The following Resident House Officer posts become vacant on 1st September, 1955 :—

St. Helens Hospital (196 Beds)
HOUSE SURGEON.
Whiston Hospital, Prescot (892 Beds)
HOUSE PHYSICIAN.
HOUSE PHYSICIAN (pædiatric).
HOUSE SURGEON (general).
HOUSE SURGEON (orthopædic).

All the above posts are recognised for Pre-registration Service.

Applications, stating age, date of qualification, and experience, and giving 2 names for reference, should be forwarded to the Secretary, Group Office, Whiston Hospital, Prescot, immediately.

STAFFORD. STAFFORDSHIRE GENERAL INFIRMARY. (175 Beds—Recovery Unit 32 Beds.) HOUSE PHYSICIAN (pre-registration post), vacant July. At end of term of service the successful applicant will be considered for appointment to a pre-registration post of House Surgeon if he or she has not held such an appointment.

Applications to Group Secretary, Stafford Hospital Management Committee, 13, Foregate-street, Stafford.

STAFFORD. STAFFORDSHIRE GENERAL INFIRMARY. (175 Beds—Recovery Unit 32 Beds.) HOUSE SURGEON (pre-registration post), vacant July. At end of term of service the successful applicant will be considered for appointment to a pre-registration post of House Physician if he or she has not held such an appointment.

Applications to Group Secretary, Stafford Hospital Management Committee, 13, Foregate-street, Stafford.

STOKE-ON-TRENT (near). HAYWOOD HOSPITAL. (96 Beds.) RESIDENT SURGICAL OFFICER (Junior Hospital Medical Officer) required. Hospital staffed by Group Consultants.

Applications to Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT (near). HAYWOOD HOSPITAL. (96 Beds.) RESIDENT MEDICAL OFFICER (Junior Hospital Medical Officer) required. Hospital staffed by Group Consultants.

Applications to Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. (455 Beds.) SENIOR HOUSE OFFICER (E.N.T.) required, vacant now. Recognised F.R.C.S.

Applications to Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent, as soon as possible.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. (455 Beds.) SENIOR HOUSE OFFICER (ophthalmology) required. Recognised F.R.C.S. and D.O.

Applications to Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. (455 Beds.) HOUSE OFFICER (general surgery) required, vacant July. Recognised F.R.C.S. and pre-registration.

Applications to Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. (455 Beds.) SENIOR HOUSE OFFICER in Orthopædics. Recognised F.R.C.S.

Applications (2 references) to Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOCKPORT AND BUXTON HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the following posts, which are approved for pre-registration purposes :—

Stockport Infirmary (162 Beds)

HOUSE OFFICER (general surgery and ophthalmology). Recognised for the F.R.C.S. and D.O.M.S. Vacant 15th July, 1955.

HOUSE OFFICER (general surgery and E.N.T.). Recognised for the F.R.C.S. and D.L.O. Vacant 1st August, 1955.

HOUSE OFFICER (general surgery and gynæcology). Recognised for the F.R.C.S. Vacant 19th July, 1955.

Stepping Hill Hospital, Stockport (496 Beds)

HOUSE OFFICER (medicine), vacant 16th July, 1955.
HOUSE OFFICER (medicine), vacant 1st August, 1955.
HOUSE OFFICER (obstetrics), vacant 14th August, 1955.

Applications, stating age, qualifications and experience, together with copies of 2 testimonials, to be addressed to the Group Secretary, 59B, Shaw-heath, Stockport, Cheshire, to be received not later than Wednesday, 6th July, 1955. The Appointments Sub-Committee will meet at 5 P.M. on Wednesday, 6th July, at the Board Room at Stockport Infirmary, when all applicants should attend for interview.

STOCKPORT. STEPPING HILL HOSPITAL. Applications are invited for the post of RESIDENT SENIOR HOUSE OFFICER (medicine), vacant 1st September, 1955.

Applications, stating age, experience and qualifications, together with copies of 2 testimonials, to be addressed to the Group Secretary, Stockport and Buxton Hospital Management Committee, 59B, Shaw-heath, Stockport, within 7 days of the appearance of this advertisement.

STOCKPORT. CHERRY TREE HOSPITAL. (Isolation—96 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER, vacant 1st September, 1955.

Applications, stating age, experience and qualifications, together with copies of 2 testimonials, to be addressed to the Group Secretary, Stockport and Buxton Hospital Management Committee, 59B, Shaw-heath, Stockport, within 7 days of the appearance of this advertisement.

SWANSEA HOSPITAL, Swansea. (407 Beds.) Glantawe HOSPITAL MANAGEMENT COMMITTEE. Registered medical practitioners are invited to apply for the appointment of ANÆSTHETIST (Senior House Officer grade) at the above Hospital, vacancy mid-July. The Hospital is recognised under the D.A. and F.F.A.R.C.S. regulations.

Applications, stating age, qualifications, and experience, together with copies of 2 recent testimonials, should be forwarded to the Hospital Secretary.

SWANSEA HOSPITAL, Swansea. (407 Beds.) Glantawe HOSPITAL MANAGEMENT COMMITTEE. Registered medical practitioners are invited to apply for the resident appointment of SENIOR HOUSE OFFICER in the Surgical Unit of the above Hospital, vacancy early August. The Hospital is recognised for the F.R.C.S. (Eng.) examinations.

Applications, stating age, qualifications, and experience, together with copies of 2 recent testimonials, should be forwarded to the Hospital Secretary.

SWANSEA. MOUNT PLEASANT HOSPITAL. Glantawe HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER in Obstetrics for the Maternity Unit of 42 Beds at the above Hospital, vacancy mid-July.

Applications, stating age, qualifications and experience, should be addressed to the Hospital Secretary.

SWINDON HOSPITAL GROUP. (507 Beds.) Applications are invited for the appointment of RESIDENT SENIOR HOUSE OFFICER as Casualty Officer and Orthopædic House Surgeon at Great Western Hospital, Swindon. Post recognised by R.C.S. for 6 months of year's training under Fellowship regulations. Work of Accident and Orthopædic Department, associated with Wingfield-Morris Orthopædic Hospital, Oxford, includes large number of industrial injuries. Salary £745 p.a., less £145 p.a. for residential emoluments.

Full details and names of 3 referees to Secretary, 7, Okus-road, Swindon, as soon as possible.

TAPLOW, near MAIDENHEAD. CANADIAN RED CROSS MEMORIAL HOSPITAL. HOUSE SURGEON required for post vacant end of July. Preference given to persons seeking pre-registration post.

Applications, stating age, qualifications with dates, and copies of 2 testimonials, to Hospital Secretary.

TORQUAY. TORBAY HOSPITAL. (106 general beds.) RESIDENT HOUSE OFFICER (surgical) Male or Female, required immediately. Post recognised for F.R.C.S. and pre-registration purposes. There is a complement of 5 Resident House Officers.

Applications, stating qualifications, nationality, and age, together with copy testimonials (quoting reference F. 955/58) to the Group Secretary, Torquay District Hospital Management Committee, Torbay Hospital, Torquay, S. Devon.

TUNBRIDGE WELLS (near). PEMBURY HOSPITAL. (383 staffed available beds.) TUNBRIDGE WELLS GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications invited for appointment of HOUSE SURGEON (Senior House Officer) to Orthopædic Unit. Post vacant 1st August, 1955, recognised for F.R.C.S. (Eng.) and tenable for 1 year. Work includes treatment of long- and short-stay cases and traumatic surgery with large outpatient and fracture clinics. National Health Service salary, less £150 p.a. for board and lodging, &c.

Apply, stating age, qualifications, and experience, with 3 testimonials, to Group Secretary, Sherwood Park, Pembury-road, Tunbridge Wells.

TAUNTON HOSPITAL MANAGEMENT COMMITTEE. TAUNTON AND SOMERSET HOSPITAL. Applications are invited for HOUSE OFFICER (general surgery). Post vacant from 1st July, 1955. Recognised for the F.R.C.S. Recognised for pre-registration candidates.

Applications, stating age, nationality, and qualifications, together with the names of 2 referees, should be forwarded immediately to the Group Secretary, Taunton and Somerset Hospital, Musgrove Park Branch, Taunton, Somerset.

TAUNTON HOSPITAL MANAGEMENT COMMITTEE. TAUNTON AND SOMERSET HOSPITAL. Applications are invited for SENIOR HOUSE OFFICER (Resident Surgical Officer). Post vacant from 13th July, 1955. Recognised for the F.R.C.S.

Applications, stating age, nationality and qualifications together with the names of 2 referees, should be forwarded to the Group Secretary, Taunton and Somerset Hospital, Musgrove Park Branch, Taunton, Somerset.

WARRINGTON GENERAL HOSPITAL. Applications are invited for the post of RESIDENT SENIOR HOUSE OFFICER (Male or Female), Obstetrics and Gynæcology, which will become vacant on 1st October, 1955. This post is recognised for the D.Obst.R.C.O.G. Scale of salary £745 p.a., less £130 for residential emoluments.

Applications, stating age, qualifications with dates, and details of experience, together with copies of recent testimonials, should be sent to the Group Secretary, Warrington and District Hospital Management Committee, c/o General Hospital, Warrington, Lancs.

WARRINGTON GENERAL HOSPITAL. (368 Beds.) Applications are invited for 2 HOUSE SURGEONS (Male or Female), recognised for pre-registration. The posts will be vacant on 25th July, 1955, and 23rd August, 1955, respectively. Salary will be £425–£525 p.a., less a deduction of £125 for full residential emoluments. The staffing of the Surgical Unit consists of a Senior Registrar, Registrar, and 2 House Surgeons. The posts offer a comprehensive training in surgery.

Apply, giving full particulars, to—
H. L. BOOT, Group Secretary,
Warrington and District Hospital Management Committee.
c/o General Hospital, Warrington, Lancs.

WARRINGTON INFIRMARY. (172 Beds.) Applications are invited from Males or Females for the post of RESIDENT HOUSE PHYSICIAN (pre-registration or Senior House Officer) at the above Hospital. Salary will be £425–£525 p.a., less a deduction of £125 for full residential emoluments, or Senior House Officer grade—£745 p.a., less £130 for residential emoluments.

Applications should be forwarded to—
H. L. BOOT, Group Secretary,
Warrington and District Hospital Management Committee.
c/o General Hospital, Warrington, Lancs.

WARWICK HOSPITAL, Lakin-road, Warwick. (264 Beds.) HOUSE PHYSICIAN. Post recognised pre-registration, resident, vacant 25th July.

Applications, with 2 testimonials, to be forwarded to Medical Superintendent.

WARWICK HOSPITAL, Lakin-road, Warwick. (264 Beds.) HOUSE SURGEON. Pre-registration or registered candidates may apply. Resident, vacant 25th July. Good experience in general surgery.

Applications, with 2 testimonials, to be forwarded to Medical Superintendent.

WATFORD, HERTFORDSHIRE. PEACE MEMORIAL HOSPITAL. CASUALTY AND ORTHOPÆDIC HOUSE SURGEON (pre-registration). Intermediate or Senior post depending on experience. Required 1st July for Orthopædic Unit (30 Beds). The Orthopædic Service is in charge of a Consultant and Registrar closely associated with a Postgraduate Teaching Hospital.

Applications, with copies of 2 testimonials, to the Administrator.

WATFORD, HERTFORDSHIRE. THE PEACE MEMORIAL HOSPITAL. (189 Beds.) Applications are invited for the post of HOUSE PHYSICIAN (pre-registration post), vacant beginning of July. Salary according to National Health Service scale.

Applications, with copies of recent testimonials, to—
CYRIL HOPKINSON, Administrator.

WATFORD, HERTFORDSHIRE. THE PEACE MEMORIAL HOSPITAL. (189 Beds.) Applications are invited for the post of HOUSE SURGEON (pre-registration post). Salary according to National Health Service scale.

Applications, with copies of recent testimonials, to—
CYRIL HOPKINSON, Administrator.

WATFORD. SHRODELLS HOSPITAL. (320 Beds.) Applications are invited for the post of GYNÆCOLOGICAL HOUSE OFFICER (pre- or post-registration). If held by a registered medical practitioner the post will be paid on Junior Hospital Medical Officer scale. Post vacant beginning of August.

Applications, together with copies of 2 testimonials, to reach the Medical Officer-in-charge as soon as possible.

WEAVERHAM, CHESHIRE. HEFFERSTON GRANGE SANATORIUM. (162 Beds.) Resident Locum SENIOR HOUSE OFFICER required immediately. Ministry of Health terms and conditions of service.

Applications to the Secretary of the Management Committee at the above address as soon as possible.

WELSH REGIONAL HOSPITAL BOARD.

REGISTRAR (general surgery), Pembroke County War Memorial Hospital, Haverfordwest (resident or non-resident).

REGISTRAR (general surgery), based West Wales General Hospital, Carmarthen (resident).

Subject to review end of first year.

Application forms from Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 14 days.

WELSH REGIONAL HOSPITAL BOARD. Whole-time Locum Tenens REGISTRAR required Accident Unit, St. David's Hospital, Cardiff, immediately.

Applications, naming 2 referees, to Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff.

WEST DORSET GROUP HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON (Male or Female) required for the following appointments :—

WEYMOUTH AND DISTRICT HOSPITAL, WEYMOUTH (124 Beds), vacant end of July.

DORSET COUNTY HOSPITAL, DORCHESTER (113 Beds), vacant mid-August.

Both posts are recognised for F.R.C.S. examination and approved for Pre-registration Service.

Applications, stating age, qualifications, and nationality, together with copy testimonials, to Group Secretary, West Dorset Hospital Management Committee, Damers-road, Dorchester, Dorset, immediately.

WEST DORSET GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. PATHOLOGICAL REGISTRAR (preferably resident) required. General laboratory and emergency duties. Some laboratory experience essential. Salary on Registrar grade, less £160 p.a. if resident. Candidates may visit the Laboratory by appointment.

Application form from Group Secretary, West Dorset Hospital Management Committee, Damers-road, Dorchester, Dorset.

WEST MALLING, KENT. LEYBOURNE GRANGE COLONY FOR MENTAL DEFECTIVES. (1372 Beds.) JUNIOR HOSPITAL MEDICAL OFFICER required at above Colony. Appointment subject to the terms and conditions for medical and dental staffs. Furnished or unfurnished married accommodation available. Ample facilities for study.

Applications, with full details as to age, nationality, qualifications, present post and previous experience, together with names and addresses of 2 referees, to the Group Secretary by 13th July, 1955.

WESTON-SUPER-MARE GENERAL HOSPITAL. (107 Beds.) Applications are invited from registered medical practitioners for the pre-registration appointment (resident) vacant 1st September, 1955, of HOUSE PHYSICIAN.

Applications, stating age, qualifications, together with names and addresses of 2 referees, should be addressed to the Secretary, Weston-super-Mare Hospital Management Committee.

WESTON-SUPER-MARE GENERAL HOSPITAL. (107 Beds.) Applications are invited from registered medical practitioners for the pre-registration appointment (resident) vacant 1st August, 1955, of HOUSE SURGEON.

Applications, stating age, qualifications, together with names and addresses of 2 referees, should be addressed to the Secretary, Weston-super-Mare Hospital Management Committee.

WHITEHAVEN HOSPITAL, Cumberland. (124 Beds, plus 27 Beds in Annexe.) HOUSE SURGEON, with orthopædic and casualty duties. (Recognised pre-registration, Senior House Officer grade if appropriate.) Vacant now. Furnished married quarters will be available.

Detailed applications, with dates and copies of 2 testimonials, to Group Secretary, Workington Infirmary, Cumberland.

WIGAN. ROYAL ALBERT EDWARD INFIRMARY. 2 HOUSE SURGEONS (pre-registration posts). Recognised F.R.C.S. 1st vacant 7th July (general duties), 2nd vacant 17th July (casualty duties).

Applications, with names of 2 referees, to Secretary, Wigan Infirmary.

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOSPITAL. (311 Beds.) HOUSE OFFICER (anæsthetics). Post vacant 15th August. The Hospital is recognised for the F.F.A.R.C.S. and D.A.

Applications, with copies of 2 testimonials, to the Secretary.

WINDSOR. KING EDWARD VII HOSPITAL. Casualty OFFICER required (Senior House Officer grade) Department forms part of Accident Service of Windsor Group ; duties include House Surgeon to E.N.T. and Eye Departments. Previous experience in treatment of acute injuries desirable.

Applications, stating age, qualifications with dates, nationality, and copies of recent testimonials, to Hospital Secretary, immediately.

WOLVERHAMPTON GROUP.

The Royal Hospital (an Associated Hospital of the University of Birmingham Medical School)

HOUSE OFFICER (casualty), vacant now.

HOUSE OFFICER (E.N.T. Department), vacant 17th July.

*2 HOUSE OFFICERS (general surgery), vacant July.

Women's Branch

*HOUSE OFFICER (gynæcological and obstetric), vacant 24th July. Appointment recognised for M.R.C.O.G.

*Approved for Pre-registration Service.

Apply, with copies of testimonials, to Secretary, The Royal Hospital, Wolverhampton.

WORCESTER (near). KNIGHTWICK SANATORIUM. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER. The post, which is resident, would be suitable for a candidate convalescent from tuberculosis. Single quarters provided. There is ample opportunity for gaining experience in the modern treatment of pulmonary tuberculosis, and minor thoracic surgery is frequently undertaken. Arrangement could be made for chest clinic work if desired.

Applications, stating age, qualifications and experience, should be sent to the Secretary at Worcester Royal Infirmary.

WORCESTER. RONKSWOOD HOSPITAL. (300 Beds.) Applications invited for post of HOUSE SURGEON (Senior House Officer) in General Surgery, vacant July.

Applications, with copies of testimonials, to the Hospital Secretary.

WORCESTER. RONKSWOOD HOSPITAL. (300 Beds.) Applications invited for post of Pre-registration HOUSE SURGEON in General Surgery, vacant in July.

Applications, with copies of testimonials, to the Hospital Secretary.

WREXHAM (near). TREVALYN MANOR MATERNITY HOSPITAL, ROSSETT. (47 Beds.) Applications are invited for the post of HOUSE SURGEON at the above Hospital to commence 1st July, 1955. The Hospital is recognised by Central Midwives Board as a Part II Midwifery Training School and deals with normal and abnormal midwifery.

Applications, stating age, qualifications and experience, together with copies of 2 recent testimonials, to be sent to the Group Secretary, Maelor General Hospital, Wrexham, as soon as possible.

YORKSHIRE. EAST RIDING HOSPITAL MANAGE- MENT COMMITTEE.

Westwood Hospital, Beverley, Yorkshire (220 Beds) Locum HOUSE OFFICER or SENIOR HOUSE OFFICER required immediately. Salary £9 10s. or £14 10s. a week respectively.

Applications to Group Secretary.

YORKSHIRE. EAST RIDING HOSPITAL MANAGE- MENT COMMITTEE.

Westwood Hospital, Beverley, Yorks (220 Beds) ORTHOPÆDIC HOUSE SURGEON (first, second, or third post). Offers good opportunity for general experience in busy acute general hospital. Approved pre-registration post. Fully qualified practitioners may apply. Recognised for F.R.C.S.

Apply to Group Secretary.

B.W.I. UNIVERSITY COLLEGE HOSPITAL OF THE WEST INDIES. (Medical Staff.) Applications are invited for HOUSE OFFICER posts (fully registered) at the above-named Hospital. This is a general Teaching Hospital of 300 Beds approved by the London University for its degrees. Duties (to commence mid-September) will either include approximately 9 months in medical casualty, plus 6 months in the Department of Obstetrics and Gynæcology, or alternatively 3 months casualty, 6 months anæsthetics, and 6 months general relieving duties in different departments. The appointments are for 1 year, to 15 months. Salary is payable at the rate of £650 p.a. Single accommodation and board are provided at a deduction of £125 p.a. Return first-class passage by sea will be paid for 1 person only.

Further information may be obtained from the Hospital Manager and Secretary, University College Hospital, Mona P.O., Jamaica, B.W.I., to whom applications stating age, nationality, and details of qualifications and experience, together with 3 recent testimonials or the names and addresses of 3 referees, should be sent by 31st July, 1955.

CANADA. OTTAWA GENERAL HOSPITAL, Ottawa, ONTARIO. (600 Bed general hospital affiliated with the Medical School of the University of Ottawa.) Residencies vacant.

Pediatrics: 100 Beds Department, outpatient clinic, 70 cots nursery. 1 RESIDENT vacancy.

Psychiatry: 30 Beds department for active treatment, adult and child guidance clinics. 2 RESIDENT vacancies.

Pathology: large department, high rate of necropsies. 1 SENIOR INTERN vacancy.

These 3 departments are approved for 2 years postgraduate training by the Royal College of Physicians and Surgeons of Canada, for Specialist certification. Remuneration: Residents $1800. Senior Interns $1200 p.a., plus room, board, and uniform.

Apply to Mother Superior.

MICHIGAN, U.S.A. OAKWOOD HOSPITAL, Dearborn, MICHIGAN. Applications are invited for 1 or 2 year General Practice RESIDENCY in new 230-Bed general hospital 10 miles from Detroit. Excellent facilities. Hospital approved for exchange-visitor programme. Salary begins at $275 per month.

Apply: Director.

ST. JOHN'S, NEWFOUNDLAND
CANADA
GENERAL HOSPITAL (475 Beds)

Applications are invited for the following posts:—
1 RESIDENCY in Medicine.
1 RESIDENCY in Surgery.
1 RESIDENCY in Orthopædics.

Salary for each of the above posts $2200 p.a., less $480 p.a. for board, maintenance, &c. Uniforms are provided; full teaching programme. The Hospital is fully accredited by the joint commission on hospital accreditation and is recognised by the Royal College of Physicians and Surgeons of Canada for 1 years training towards certification.

Transportation to St. John's will be paid by the Hospital and on completion of 1 years service return passage will be provided.

Applications with full details to be forwarded to—
Dr. E. WILSON,
Superintendent,
General Hospital,
St. John's, Newfoundland.

28th May, 1955.

Public Appointments

LONDON COUNTY COUNCIL. Ophthalmologist required for 2 sessions a week for the examination and certification of blind and partially sighted persons. Applications invited from medical practitioners of Consultant status. Fee 4 guineas a session of 1¼–2½ hours, plus mileage allowance.

Application forms from the Medical Officer of Health (D.I), The County Hall, Westminster Bridge, S.E.1, returnable by 16th July. (997.)

FACTORY DOCTORS. Factories Acts, 1937 and 1948. The following appointment as Appointed Factory Doctor is vacant. Apply to Chief Inspector of Factories, 19, St. James's-square, London, S.W.1

District	*County*	*Latest date for receipt of applications*
CRICKHOWELL ..	BRECON ..	16TH JULY, 1955

GOLD COAST LOCAL CIVIL SERVICE. Government OF THE GOLD COAST. MEDICAL OFFICERS with registrable qualifications are required for general duties, including hospital and district work. Appointment will be to the Gold Coast Local Civil Service and may be made as follows:—

(*a*) Contract for 2 tours of duty of 18–24 months with gratuity (taxable) at the rate of £37 10s. for each completed 3 months of service. Salary in the scale £1330–£2310 a year.

(*b*) On 3 years probation for permanent and pensionable employment. Pension (non-contributory) at the age of 45–55 is earned at the rate of 1/600th of the final pensionable emoluments for each completed month of service. Salary in the scale £1055–£1850.

(*c*) Doctors in the National Health Service may resign from the National Health Service but retain their superannuation rights while in the Gold Coast (up to 6 years) and receive a gratuity (taxable) of 20% of their Gold Coast salary after their engagement. Salary in the scale £1055–£1850 a year.

Starting-point in salary scales is determined according to qualifications and experience. Quarters are provided at rental not exceeding £150 a year. Income-tax at local rates. Free passages provided for Officer, wife, and up to 3 children under 13 years of age. Generous home leave is granted after each tour.

Application forms can be obtained from the Director of Recruitment Colonial Office, Sanctuary Buildings, Great Smith-street, London, S.W.1 (quoting reference No: BCD.117/13/04).

HER MAJESTY'S OVERSEA CIVIL SERVICE. Medical BRANCH—TANGANYIKA. MEDICAL OFFICERS required in the Medical Department of Tanganyika for general duties. Candidates would normally be based on a hospital but must be prepared to tour and to assist in training African staff. Candidates must be registered by the General Medical Council in the United Kingdom or possess qualifications entitling them to such registration. There are 2 vacancies for which candidates possessing the F.R.C.S. are required; they would be regarded as available for general medical duties but the Director would allot surgical work to them as far as possible. Appointments can be made on a permanent basis with pension (non-contributory) at age of 55, or on short-term contract with gratuity (taxable) payable on satisfactory completion of service. A doctor in the National Health Service may resign from the National Health Service but retain his superannuation rights (up to a limit of 6 years) and receive a gratuity (taxable) of 20% of the aggregate of his salary after his engagement. Salary varies from £1116 to £1836 a year; starting-point is determined by experience and 4 extra increments are given to successful candidates possessing the F.R.C.S., D.P.H., or other approved higher qualifications. Temporary cost-of-living allowance at the rate of 10% of salary is also payable, subject to a maximum of £162 a year making gross emoluments of £1228–£1998 a year. Permanent Medical Officers are eligible to be considered at any time for promotion to super-scale posts in Tanganyika and other territories in medical administration or, if they possess higher qualifications and suitable experience, in specialist posts. Quarters are generally available at rental varying from £30 to £78 a year according to size and type and furniture at a rate varying from £6 to £24 a year. Free passages in both directions for Officer and wife and up to cost of 4 adult fare for children. Taxation at local rates. Annual local leave permissible and generous home leave granted after each tour of from 30 to 36 months. Educational facilities are available. There are also vacancies for medical officers for general duties in several other Oversea territories.

Application forms from Director of Recruitment, Colonial Office, Sanctuary Buildings, Great Smith-street, London, S.W.1 (quoting reference No. BCD.117/8/02).

LONDON TRANSPORT. Applications are invited from registered medical practitioners for a post of MEDICAL OFFICER (Woman). The successful applicant will be responsible to the Chief Medical Officer for general clinical work including the Junior Staff Health scheme and the medical supervision of working conditions. Commencing salary £1400 p.a. The appointment is subject to a medical examination. On completion of a satisfactory probationary period, the selected applicant will be expected to join a contributory superannuation scheme.

Applications, giving full details of qualifications and experience, together with the names of 3 referees, should be sent within 14 days of the appearance of this advertisement to the Staff Officer (F/EV540), London Transport, 55, Broadway, S.W.1.

MANCHESTER. CITY OF MANCHESTER EDUCA- TION COMMITTEE. Applications are invited for the post of MEDICAL OFFICER (School Health). Preference will be given to candidates who have had special experience in diseases of children and retinoscopy, and hold D.P.H. or D.C.H. Salary £950–£1300.

Application form and particulars (stamped addressed foolscap envelope) from the Chief Education Officer, P.O. Box 480, Education Offices, Deansgate, Manchester, 3. To be returned by 30th July, 1955.

NOTTINGHAM. CITY OF NOTTINGHAM EDUCA- TION COMMITTEE. Applications are invited for the post of SCHOOL MEDICAL OFFICER on the salary scale £975–£50 £1375 p.a. The appointment will be subject to the provisions of the Local Government superannuation acts.

Further particulars and forms of application may be obtained from the Principal School Medical Officer, 28, Chaucer-street, Nottingham. F. STEPHENSON, Director of Education.

NATIONAL COAL BOARD. North-Western Division. Applications are invited from registered medical practitioners for the post of ASSISTANT AREA MEDICAL OFFICER, who will assist in the supervision of an Industrial Health Service, including examination of new entrants. The work entails underground visits. Should have completed hospital and other postgraduate training. Experience in general practice, and interest in preventative or industrial medicine an advantage. Salary range £1100–£1600. Candidates with fair amount of postgraduate experience will receive starting salary not less than £1200.

Applications, stating age, qualifications, and experience (plus names of 2 referees) to Establishments Officer, 40, Portland-street, Manchester, 1, within 14 days.

MONTGOMERY. COUNTY OF MONTGOMERY. Mixed appointment of DISTRICT MEDICAL OFFICER OF HEALTH AND ASSISTANT COUNTY MEDICAL OFFICER. Applications are invited from duly qualified and registered medical practitioners who possess a Diploma in Public Health, Sanitary Science or State Medicine for the appointment of a Medical Officer to act as Assistant County Medical Officer of Health and Medical Officer of Health to 5 District Councils situate in the northern half of the County (comprising the 3 Boroughs of Llanfyllin, Montgomery and Welshpool and the 2 Rural Districts of Forden and Llanfyllin). The salary will be in accordance with the recent arbitration award of the Industrial Court, i.e., £1471 17s. 6d.–£1826 17s. 6d. p.a. A motor-car allowance will be paid.

Further particulars and form of application may be obtained from the undersigned. Canvassing disqualifies.

P. E. WHITE, Clerk of the County Council.

County Offices, Welshpool, Montgomeryshire.

ROYAL ARMY MEDICAL CORPS. New Conditions and Terms of Service. Regular and Short-service Commissions. New and improved conditions of service in the R.A.M.C. are now offered to Medical Practitioners. These include :—

Permanent commissions direct from civil life.

After 1 years satisfactory service, grant of £1500 (taxable) to officers appointed to a regular commission after 1st October, 1953.

Antedates (which count towards pay and promotion) of up to 7 years for civilian experience, and credit for former commissioned service as a medical or combatant officer in any of the 3 services.

A 3-year Short-service Commission offers an alternative to National Service with higher rates of pay and allowances and eligibility for married quarters.

Increases in pay for Captains and above.

Increased rates of specialist pay.

A limited number of vacancies exist for experienced specialists of the Consultant or Senior Registrar grade.

Excellent facilities are offered for training selected young medical officers as specialists. Approximately one Medical Officer in 3 will be selected for specialist training.

For full details application should be made to the Assistant Director-General, A.M.D.2, The War Office, London, S.W.1. Telephone inquiries should be made to the Staff Captain, J. A. WALE, M.B.E., No. GROsvenor 8040, Ext. 548.

TREASURY MEDICAL SERVICE. Applications are invited from medical practitioners, practising in the districts detailed below, for appointment, in a part-time and mainly advisory capacity, as LOCAL TREASURY MEDICAL OFFICER for each of the places or groups of places shown. The town shown in brackets after the place-names indicates the Head Post Office Area in which the place, or group of places, is situated. Successful applicants will be required to examine and report on the condition of certain Government Officers, teachers, candidates for appointment, &c., who may be referred to them from time to time; and to attend when summoned to an emergency case of accident or sudden illness occurring in a Government office in the neighbourhood. Fees for this work, and mileage allowance where necessary, will be paid on a scale agreed with the British Medical Association.

Intending applicants should write, within 14 days, to Treasury Medical Adviser, Treasury Chambers, Whitehall, S.W.1, for a form on which application may be made. Applicants should be not more than 60 years of age.

The places for which applications are invited are as follows :—

ENGLAND AND WALES

Tuxford (Newark).
Southwell (Newark).
Sparkbrook and Sparkhill (Birmingham).
Leeds, 7 (Leeds).
Odiham (Basingstoke).

SCOTLAND

Whithorn (Newton Stewart).
Bo'ness (Bathgate).

NORTHERN IRELAND

Lisburn (Lisburn).

YORKSHIRE. NORTH RIDING OF YORKSHIRE COUNTY COUNCIL. DEPUTY COUNTY MEDICAL OFFICER. Applications are invited for this whole-time post from registered medical practitioners holding a Degree or Diploma in Public Health. Previous experience in health administration is essential. The candidate appointed will be required to undertake any duties allotted to him bearing on the Health and School Health Services of the County. He will act under the administrative control of, and be responsible to, the County Medical Officer, who is also Principal School Medical Officer. He will be required to provide a car for which he will be paid on the County Council's scale. Salary £1600, rising to £1850 p.a.; appointment superannuable. Canvassing in any form will disqualify.

Forms of application and further particulars obtainable from County Medical Officer, and returnable to the Clerk of the County Council, County Hall, Northallerton, before 23rd July, 1955.

SMETHWICK. COUNTY BOROUGH OF SMETHWICK. Appointment of MEDICAL OFFICER OF HEALTH AND PRINCIPAL SCHOOL MEDICAL OFFICER. Applications for this post are invited from medical practitioners who hold the qualifications prescribed by the Local Government Act, 1933, and the regulations made thereunder. The Council have adopted the salary scales and conditions of service agreed by Committee "C" of the Medical Whitley Council and the salary attached to the post is £1937 10s. p.a., rising by 5 annual increments of £51 10s. to a maximum of £2195 p.a., plus a motor-car allowance of £165 p.a. The successful applicant will also be responsible for the general direction and supervision of the Council's Welfare Services and the Welfare Section of the Civil Defence Corps. The post is superannuable and the person appointed will not be permitted to engage in private practice as a medical practitioner. The appointment will be subject to termination by 3 months notice in writing.

Applications, giving full particulars of age, qualifications, present and past appointments, general experience, and including the names and addresses of 3 referees, must reach the undersigned not later than 12th July, 1955.

E. L. TWYCROSS, Town Clerk.

Council House, Smethwick, 40.

General Practice

For an Executive Council post (England and Wales) apply on form E.C.16A *obtainable from the council. Mark envelope "Vacancy."*

BATLEY, YORKSHIRE. Applications are invited for a general medical practice VACANCY in urban industrial area. List at present 2321. Surgery and residential accommodation available for purchase. Apply on Form E.C.16A to the undersigned, from whom further particulars and forms may be obtained. Closing date for applications 22nd July, 1955.

C. H. STABLER, Clerk.

The Executive Council of the West Riding of Yorkshire.
5, St. John's-north, Wakefield, Yorks.

Miscellaneous

To non-professional posts the Notification of Vacancies Order 1952 applies.

Medical Officer required by Falkland Islands Dependencies Survey for tour of 18 or 30 months service in Antarctic bases. To leave U.K. in October, 1955. Salary £625 a year. Free passages, quarters, messing and canteen stores. Liberal leave on full salary. Candidates must possess qualifications registrable in the United Kingdom.—Write to the Crown Agents, 4, Millbank, London, S.W.1. State age, name in block letters, full qualifications and experience and quote M3A/35315/LD.

First-floor Wimpole-street consulting-room with separate examination room in quiet well-run house; including reception, usual services, £300 p.a.—Telephone : WELbeck 0476.

Southampton. Ideally situated and specially fitted for professional and private use. Freehold residence of character. 5 bedrooms (h. and c.). Bathroom. 4 reception or consulting rooms. Cloakroom. Anteroom. Modern domestic offices with Aga. Complete central heating system (automatic oil burner). Double garage. Easily maintained grounds of ½ acre. Faultless condition throughout.—Full particulars and photograph from FOX & SONS, 32, London-road, Southampton (Tel. : 25155).

Applicants for posts requiring testimonials copied or duplicated should communicate with MANTON SECRETARIAL SERVICE LTD., 98, Victoria-street, S.W.1 (Phone : VICtoria 0141), who are specialists in this kind of work.

Typewriting and Duplicating. First-class work at moder-ate prices by experienced medical typists.—SYBIL RANG, 21, Heath-street, Hampstead, London, N.W.3 (HAM. 5329/0504).

"Pregnancy Diagnosis by the Xenopus Method," 24-hour service. Send specimen of urine and £1 1s. fee. Hæmatology, Biochemistry, Flame Photometry.—WELBECK BIOLOGICAL LABORATORIES, 26, Park-crescent, Portland-place, W.1 (MUSeum 5386–7).

Family Planning Association.

Sub-fertility Centre. Investigation and advice on treatment of sub-fertility problems. Patients accepted only through doctors, hospitals and clinics.

Pregnancy Diagnosis. Specimens of urine accepted for testing (Hogben Test) from doctors, hospitals and clinics anywhere. Results available within 24 hours of receipt of specimen.

Telephone or write for details : Family Planning Association, 64, Sloane-street, London, S.W.1 (SLOane 9112).

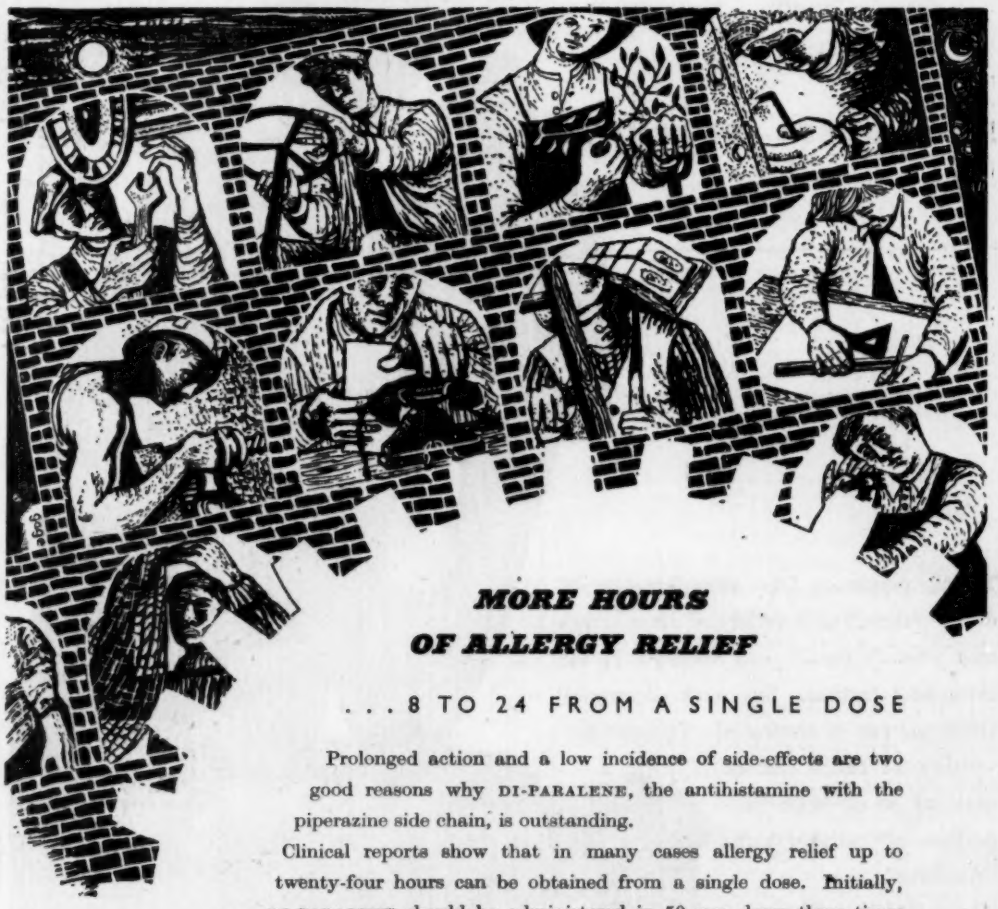
Portanmet for Sale. Portanmet with usual fittings and dental nose-piece and harness as well. First-class mechanical order. Price £40 or near offer.—Address, No. 145, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Austin. The New Show Models A.30, A.40, A.50 and A.90. Limited number of orders now acceptable from proven essential users for delivery ahead.—Demonstrations, easy terms, brochures, application forms on request, from H. A. SAUNDERS LIMITED, Austin House, 140–144, Golders Green-road, Golders Green, London, N.W.11.

MALAYA.—A Resident Medical Officer is required for a Tin Mining Company, near Kuantan, East Coast of Malaya in the State of Pahang. Basic salary at rate of St. $1500 (£175) per month. If married a married allowance of St. $150 (£17 10s.) per month is paid. Passages, furnished accommodation, home leave, pension scheme apply. Tropical, clinical and hygiene experience an advantage.

Applications, with full particulars, to Box No. 8854, c/o CHARLES BARKER & SONS LTD., 31, Budge-row, London, E.C.4.

PUBLISHED by the PROPRIETORS, THE LANCET LIMITED, 7, Adam Street, Adelphi, in the County of London.
Printed by HAZELL, WATSON & VINEY, LTD., London and Aylesbury—Saturday, July 2, 1955.
PRINTED IN GREAT BRITAIN—Entered as Second Class at the New York, U.S.A., Office.



MORE HOURS OF ALLERGY RELIEF

. . . 8 TO 24 FROM A SINGLE DOSE

Prolonged action and a low incidence of side-effects are two good reasons why DI-PARALENE, the antihistamine with the piperazine side chain, is outstanding.

Clinical reports show that in many cases allergy relief up to twenty-four hours can be obtained from a single dose. Initially, DI-PARALENE should be administered in 50 mg. doses three times a day, but in the majority of cases this dosage can soon be reduced to one or two doses a day. Often a single dose at bedtime will provide symptomatic relief until the next bedtime. Undesirable side-effects are comparatively few and mild.

Why not try DI-PARALENE in your difficult allergy cases this season? This longer-acting antihistamine is available as 50 mg. tablets in bottles of 25, 100 and 500.

Try Abbott's longer-acting antihistamine.

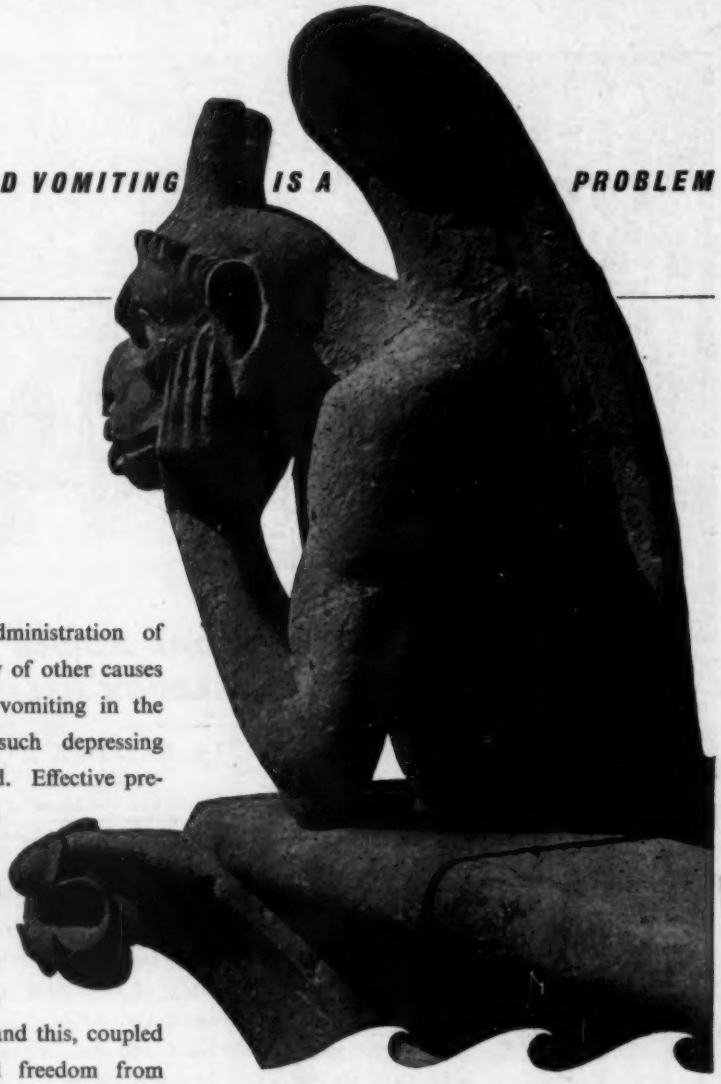
DI-PARALENE
(Chlorcyclizine Hydrochloride, Abbott)

Abbott

For literature and professional sample of this longer-acting antihistamine write to:—

ABBOTT LABORATORIES LIMITED • PERIVALE • GREENFORD • MIDDLESEX

WHEN NAUSEA AND VOMITING IS A PROBLEM



Travel, pregnancy, the administration of drugs — these and a variety of other causes may produce nausea and vomiting in the susceptible patient. But such depressing symptoms can be controlled. Effective prevention or relief can be obtained in a large proportion of patients using 'Avomine'.

'Avomine' is effective in small dosage. The drug has a long duration of action, and this, coupled with its low toxicity and freedom from side-effects, makes 'Avomine' a safe form of treatment, even for children.

'AVOMINE'
trade mark brand
PROMETHAZINE 8-CHLOROTHEOPHYLLINATE

THE GENERAL-PURPOSE ANTI-EMETIC

SUPPLIES
Containers of 10 x 25 mgm. tablets.

MANUFACTURED BY
MAY & BAKER LTD

An M&B brand MEDICAL PRODUCT MA2644

DISTRIBUTORS: PHARMACEUTICAL SPECIALITIES (MAY & BAKER) LTD · DAGENHAM · ESSEX